Yamcs HTTP API

Release 5.1.4-SNAPSHOT

Space Applications Services

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CONTENTS

CHAPTER

ONE

API OVERVIEW

Yamcs provides an HTTP API allowing external tools to integrate with Yamcs resources. Most HTTP endpoints send and expect JSON messages.

Hint: If you develop in Python consider using the Python Client[1] which provides an idiomatic mapping for most of the operations documented here.

HTTP Verbs

The supported HTTP verbs are:

GET Retrieve a resource

POST Create a new resource

PATCH Update an existing resource

DELETE Delete a resource

Time

All timestamps are returned as UTC and formatted according to ISO 8601. For example:

2015-08-26T08:08:40.724Z 2015-08-26

Error Handling

When an exception is caught while handling an HTTP request, the server will try to give some feedback to the client by wrapping it in a generic exception message like so:

```
{
  "exception" : {
    "type": string, // Short
    "msg": string // Long
  }
}
```

Clients should check on whether the status code is between 200 and 299, and if not, interpret the response with the above structure.

[1] https://yamcs.org/docs/yamcs-python/

CORS

Cross-origin Resource Sharing (CORS) allows access to the Yamcs HTTP API from a remotely hosted web page. This is the HTML5 way of bypassing the self-origin policy typically enforced by browsers. With CORS, the browser will issue a preflight request to Yamcs to verify that it allows browser requests from the originating web page.

CORS is off by default on Yamcs Server, but available through configuration.

JSON

All API methods are designed for JSON-over-HTTP. Matching type definitions in this documentation are written in TypeScript syntax because of its high readability. Note however that we do not currently mark parameters as optional (`?`).

Protobuf

As an alternative to JSON, most endpoints also support Google Protocol Buffers for a lighter footprint. To mark a request as Protobuf, set this HTTP header:

```
Content-Type: application/protobuf
```

If you also want to server to respond with Protobuf messages, add the `Accept` header:

```
Accept: application/protobuf
```

The proto files are available on GitHub[2]. Using the `protoc` compiler, client code can be generated for Java, Python, C++ and more.

If the response status is not between `200` and `299`, deserialize the response as of type `yamcs.api.ExceptionMessage`.

[2] https://github.com/yamcs/yamcs/blob/master/yamcs-api/src/main/proto/yamcs/protobuf

CHAPTER

TWO

WEBSOCKET

Yamcs provides a WebSocket API for data subscriptions. A typical use case would be a display tool subscribing to parameter updates. But you could also subscribe to realtime events, alarms or even raw packets.

WebSocket allows to upgrade a regular HTTP connection to a bi-directional communication channel. Yamcs supports an RPC-style API over this channel where clients choose what topics they want to subscribe (or unsubscribe) by sending a request in a specific format.

Note: Users that have been using Yamcs versions prior to 5.x.x may be familiar with our previous WebSocket conventions on the old endpoint `/_websocket`. This documentation describes the new conventions applied on the endpoint `/api/websocket`. These build on lessons learned over the years. In particular:

- Subscription and unsubscription of multiple topics is now easier to manage on one and the same connection.
- Topics that previously could be subscribed to only once (for example listening to a specific stream), can now be subscribed any number of times.
- There is no longer server state on a shared `instance` or `processor` associated to a WebSocket connection. All RPC calls expect you to be explicit about which instance or processor you are subscribing to (if the topic requires this information).

2.1 Connection

WebSocket calls should use a URL of the form `http://localhost:8090/api/websocket`

We suggest using a generic library for establishing a WebSocket connection because the protocol is quite involving.

On the server-side, Yamcs supports two WebSocket subprotocols:

1. Textual WebSocket frames encoded in JSON
2. Binary WebSocket frames encoded in Google Protocol Buffers

To select one or the other specify this header on your WebSocket upgrade request:

```
Sec-WebSocket-Protocol: protobuf
```

or:

```
Sec-WebSocket-Protocol: json
```

When unspecified, the server defaults to JSON. These two formats are functionally identical.

Note: For readability purposes, the next sections focus on JSON.

2.2 Client Message

A message sent by the client to Yamcs must always have this general form:

```
{
  "type": string,
  "options": any | undefined,
  "id": number | undefined,
  "call": number | undefined
}
```

Where:

type The message type. Typically this is the topic to subscribe to, but it could also be a built-in like `cancel`.

options Options specific to the type.

id An optional client-side message identifier. If you specify this, then Yamcs will return it in reply messages. This purpose of this property is to allow clients to correlate replies with the original request. This is necessary because Yamcs does not guarantee in-order delivery of replies with respect to client requests.

We recommend to use an incrementing number. Yamcs does not currently check on continuity, but it is something we may consider later on.

call Where applicable, this must contain the call associated with this message. This should only be used when the client is streaming multiple messages handled by the same call. Client-streaming is rarely used, so chances are that you will never need to use this option.

2.2.1 Built-in Client messages

Cancel

```
{
  "type": "cancel",
  "options": {
    "call": number
  }
}
```

This message allows to cancel an ongoing call. The call to cancel must be specified as part of the message options.

State

```
{
  "type": "state"
}
```

In response to this message, Yamcs will dump a snapshot of the active calls on the current connection. This is intended for debugging reasons.

2.3 Server Messages

A message sent by the Yamcs to the client will always have this general form:

```
{
  "type": string,
  "call": number | undefined,
  "seq": number | undefined,
  "data": any
}
```

Where:

type The message type. Typically this is the topic that was subscribed to, but it could also be a built-in like `reply`.

call Where applicable, this contains the call identifier for this message. For the typical case of server-streams, all server messages for a single client request, have the same call identifier.

seq This is a sequence counter scoped to the call. The purpose of this is so that client could detect when some messages have been skipped. Yamcs applies a WebSocket-wide mechanism whereby frames are dropped if the client is not reading fast enough. If enough frames are dropped, the client connection may even be closed.

data Data associated with this type of server message.

2.3.1 Built-in Server messages

Reply

```
{
  "type": "reply",
  "call": number,
  "seq": number,
  "data": {
    "reply_to": number,
    "exception": any | undefined
  }
}
```

This message is sent by the server in response to a topic request. Yamcs guarantees that this reply message is sent before any other topic messages. The field `reply_to` contains a reference to the `id` from the original client message. If there was an error in handling the request, the reply will provide exception details. This is an object that follows the same structure as exceptions on the regular HTTP API.

State

```
{
  "type": "state",
  "data": {
    "calls": [
      {
        "call": number,
        "type": string,
        "options": any | undefined
      },
      ...
    ]
```

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```
  }
}
```

This message is sent in response to a request of type `state`. It dumps a list of all active calls. The intended use is for debugging issues. Client that support reconnection cannot rely on this information because it will no longer be present when a new connection is established.

2.4 Example

A simple Hello World example would be to subscribe to time updates coming from the server. Assuming that your Yamcs server has an instance called `myproject`, you would send a message like this indicating your interest:

```
{
  "type": "time",
  "id": 1,
  "options": {
    "instance": "myproject"
  }
}
```

To confirm your request, Yamcs will first send you a reply that looks somewhat like this:

```
{
  "type": "reply",
  "call": 3,
  "seq": 72,
  "data": {
    "@type": "/yamcs.api.Reply",
    "reply_to": 1
  }
}
```

As the client, we note that the server has assigned the call identifier `3` to this subscription.

Note: The property `@type` is an artifact generated by Yamcs JSON backend. It specifies the equivalent Protobuf message type of the `data` object (Yamcs generates JSON based on Protobuf definitions). You should be able to ignore this property because we enforce each message `type` to be using only a single `data` message.

Next we receive continued time updates, each in a WebSocket frame:

```
{
  "type": "time",
  "call": 3,
  "seq": 73,
  "data": {
    "@type": "/google.protobuf.Timestamp",
    "value": "2020-05-14T06:44:32.654Z"
  }
}
```

```
{
  "type": "time",
  "call": 3,
  "seq": 74,
  "data": {
    "@type": "/google.protobuf.Timestamp",
```

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```
    "value": "2020-05-14T06:44:33.656Z"
  }
}
```

Note that each of these updates can be linked to the call identifier `3`. If you had multiple subscriptions going on, this would allow you to couple messages to the correct local handler.

Once you're no longer interested to receive updates for this particular call, you can cancel it like this:

```
{
  "type": "cancel",
  "options": {
    "call": 3
  }
}
```

Of course, if you have no plans to use this connection for other calls, you could as well have closed it altogether.

CHAPTER

THREE

ALARMS

3.1 List Alarms

List alarms

URI Template

```
GET /api/archive/{instance}/alarms
```

{instance} Yamcs instance name.

Query Parameters

pos

The zero-based row number at which to start outputting results. Default: `0`

limit

The maximum number of returned records per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

start

Filter the lower bound of the alarm's trigger time. Specify a date string in ISO 8601 format. This bound is inclusive.

stop

Filter the upper bound of the alarm's trigger time. Specify a date string in ISO 8601 format. This bound is exclusive.

order

The order of the returned results. Can be either `asc` or `desc`. The sorting is always by trigger time (i.e. the generation time of the trigger value). Default: `desc`

Response Type

```
interface ListAlarmsResponse {
  alarms: AlarmData[];
}
```

Related Types

```
// Summary of an alarm applicable for Parameter or Event (possibly
// other in the future) alarms.
// Contains detailed information on the value occurrence that initially
// triggered the alarm, the most severe value since it originally triggered,
// and the latest value at the time of your request.
interface AlarmData {
  type: AlarmType;
  triggerTime: string;  // RFC 3339

  // For parameter alarms, this is the id of the parameters
  // For event alarms
  //   - the id.namespace is /yamcs/event/<EVENT_SOURCE>, unless
  //     EVENT_SOURCE starts with a "/" in which case the namespace
  //     is just the <EVENT_SOURCE>
  //   - the id.name is the <EVENT_TYPE>
  id: NamedObjectId;

  // Distinguisher between multiple alarms for the same id
  seqNum: number;
  severity: AlarmSeverity;

  // Number of times the object was in alarm state
  violations: number;

  // Number of samples received for the object
  count: number;
  acknowledgeInfo: AcknowledgeInfo;
  notificationType: AlarmNotificationType;
  parameterDetail: ParameterAlarmData;
  eventDetail: EventAlarmData;

  // Whether the alarm will stay triggered even when the process is OK
  latching: boolean;

  // if the process that generated the alarm is ok (i.e. parameter is within␣
↪limits)
  processOK: boolean;

  // triggered is same with processOK except when the alarm is latching
  triggered: boolean;

  // if the operator has acknowledged the alarm
  acknowledged: boolean;

  // Details in case the alarm was shelved
  shelveInfo: ShelveInfo;
  clearInfo: ClearInfo;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
```

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```
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface AcknowledgeInfo {
  acknowledgedBy: string;
  acknowledgeMessage: string;
  acknowledgeTime: string;  // RFC 3339
}

interface ParameterAlarmData {
  triggerValue: ParameterValue;
  mostSevereValue: ParameterValue;
  currentValue: ParameterValue;
  parameter: ParameterInfo;
}

interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
```

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```
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}
```

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```
interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}
```

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```
interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
```

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```
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface EventAlarmData {
  triggerEvent: Event;
  mostSevereEvent: Event;
```

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```
  currentEvent: Event;
}

interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}

interface ShelveInfo {
  shelvedBy: string;
  shelveMessage: string;
  shelveTime: string;  // RFC 3339

  //when the shelving will expire (can be unset which means that it will never
↪expire)
  shelveExpiration: string;  // RFC 3339
}

interface ClearInfo {
  clearedBy: string;
  clearTime: string;  // RFC 3339

  //if the alarm has been manually cleared, this is the message provided by the
↪operator
  clearMessage: string;
}

enum AlarmType {
  PARAMETER = "PARAMETER",
  EVENT = "EVENT",
}

enum AlarmSeverity {
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmNotificationType {
  ACTIVE = "ACTIVE",
  TRIGGERED = "TRIGGERED",
  SEVERITY_INCREASED = "SEVERITY_INCREASED",
  VALUE_UPDATED = "VALUE_UPDATED",
  ACKNOWLEDGED = "ACKNOWLEDGED",
  CLEARED = "CLEARED",
  RTN = "RTN",
  SHELVED = "SHELVED",
  UNSHELVED = "UNSHELVED",
  RESET = "RESET",
```

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```
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

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```
enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}

enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",
```

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```
  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

3.2 List Parameter Alarms

List alarms for a specific parameter

URI Template

```
GET /api/archive/{instance}/alarms/{parameter*}
```

{instance}

{parameter*}

Query Parameters

pos

limit

start

stop

order

detail

Response Type

```
interface ListParameterAlarmsResponse {
  alarms: AlarmData[];
}
```

Related Types

```
// Summary of an alarm applicable for Parameter or Event (possibly
// other in the future) alarms.
// Contains detailed information on the value occurrence that initially
// triggered the alarm, the most severe value since it originally triggered,
// and the latest value at the time of your request.
interface AlarmData {
  type: AlarmType;
  triggerTime: string;  // RFC 3339

  // For parameter alarms, this is the id of the parameters
  // For event alarms
```

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```
  //   - the id.namespace is /yamcs/event/<EVENT_SOURCE>, unless
  //     EVENT_SOURCE starts with a "/" in which case the namespace
  //     is just the <EVENT_SOURCE>
  //   - the id.name is the <EVENT_TYPE>
  id: NamedObjectId;

  // Distinguisher between multiple alarms for the same id
  seqNum: number;
  severity: AlarmSeverity;

  // Number of times the object was in alarm state
  violations: number;

  // Number of samples received for the object
  count: number;
  acknowledgeInfo: AcknowledgeInfo;
  notificationType: AlarmNotificationType;
  parameterDetail: ParameterAlarmData;
  eventDetail: EventAlarmData;

  // Whether the alarm will stay triggered even when the process is OK
  latching: boolean;

  // if the process that generated the alarm is ok (i.e. parameter is within␣
↪limits)
  processOK: boolean;

  // triggered is same with processOK except when the alarm is latching
  triggered: boolean;

  // if the operator has acknowledged the alarm
  acknowledged: boolean;

  // Details in case the alarm was shelved
  shelveInfo: ShelveInfo;
  clearInfo: ClearInfo;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface AcknowledgeInfo {
  acknowledgedBy: string;
  acknowledgeMessage: string;
  acknowledgeTime: string;  // RFC 3339
}

interface ParameterAlarmData {
  triggerValue: ParameterValue;
  mostSevereValue: ParameterValue;
  currentValue: ParameterValue;
  parameter: ParameterInfo;
}

interface ParameterValue {
  id: NamedObjectId;
```

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```
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}
```

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```
interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;
```

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```
  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}
```

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```
interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;
```

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```
  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface EventAlarmData {
  triggerEvent: Event;
  mostSevereEvent: Event;
  currentEvent: Event;
}

interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}

interface ShelveInfo {
  shelvedBy: string;
```

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```
  shelveMessage: string;
  shelveTime: string;  // RFC 3339

  //when the shelving will expire (can be unset which means that it will never␣
↪expire)
  shelveExpiration: string;  // RFC 3339
}

interface ClearInfo {
  clearedBy: string;
  clearTime: string;  // RFC 3339

  //if the alarm has been manually cleared, this is the message provided by the␣
↪operator
  clearMessage: string;
}

enum AlarmType {
  PARAMETER = "PARAMETER",
  EVENT = "EVENT",
}

enum AlarmSeverity {
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmNotificationType {
  ACTIVE = "ACTIVE",
  TRIGGERED = "TRIGGERED",
  SEVERITY_INCREASED = "SEVERITY_INCREASED",
  VALUE_UPDATED = "VALUE_UPDATED",
  ACKNOWLEDGED = "ACKNOWLEDGED",
  CLEARED = "CLEARED",
  RTN = "RTN",
  SHELVED = "SHELVED",
  UNSHELVED = "UNSHELVED",
  RESET = "RESET",
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

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```
enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
```

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```
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}

enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",

  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

3.3 List Processor Alarms

List alarms

URI Template

```
GET /api/processors/{instance}/{processor}/alarms
```

{instance}

{processor}

Response Type

```
interface ListProcessorAlarmsResponse {
  alarms: AlarmData[];
}
```

Related Types

```
// Summary of an alarm applicable for Parameter or Event (possibly
// other in the future) alarms.
// Contains detailed information on the value occurrence that initially
// triggered the alarm, the most severe value since it originally triggered,
// and the latest value at the time of your request.
interface AlarmData {
  type: AlarmType;
  triggerTime: string;  // RFC 3339

  // For parameter alarms, this is the id of the parameters
  // For event alarms
  //   - the id.namespace is /yamcs/event/<EVENT_SOURCE>, unless
  //     EVENT_SOURCE starts with a "/" in which case the namespace
  //     is just the <EVENT_SOURCE>
  //   - the id.name is the <EVENT_TYPE>
  id: NamedObjectId;

  // Distinguisher between multiple alarms for the same id
  seqNum: number;
  severity: AlarmSeverity;

  // Number of times the object was in alarm state
  violations: number;

  // Number of samples received for the object
  count: number;
  acknowledgeInfo: AcknowledgeInfo;
  notificationType: AlarmNotificationType;
  parameterDetail: ParameterAlarmData;
  eventDetail: EventAlarmData;

  // Whether the alarm will stay triggered even when the process is OK
  latching: boolean;

  // if the process that generated the alarm is ok (i.e. parameter is within␣
↪limits)
  processOK: boolean;
```

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```
  // triggered is same with processOK except when the alarm is latching
  triggered: boolean;

  // if the operator has acknowledged the alarm
  acknowledged: boolean;

  // Details in case the alarm was shelved
  shelveInfo: ShelveInfo;
  clearInfo: ClearInfo;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface AcknowledgeInfo {
  acknowledgedBy: string;
  acknowledgeMessage: string;
  acknowledgeTime: string;  // RFC 3339
}

interface ParameterAlarmData {
  triggerValue: ParameterValue;
  mostSevereValue: ParameterValue;
  currentValue: ParameterValue;
  parameter: ParameterInfo;
}

interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
```

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```
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
```

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```
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface EnumerationAlarm {
  level: AlarmLevelType;
```

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```
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}
```

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```
interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}
```

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```
interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface EventAlarmData {
  triggerEvent: Event;
  mostSevereEvent: Event;
  currentEvent: Event;
}

interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}

interface ShelveInfo {
  shelvedBy: string;
  shelveMessage: string;
  shelveTime: string;  // RFC 3339

  //when the shelving will expire (can be unset which means that it will never␣
↪expire)
  shelveExpiration: string;  // RFC 3339
}

interface ClearInfo {
  clearedBy: string;
  clearTime: string;  // RFC 3339

  //if the alarm has been manually cleared, this is the message provided by the␣
↪operator
  clearMessage: string;
}

enum AlarmType {
  PARAMETER = "PARAMETER",
  EVENT = "EVENT",
}

enum AlarmSeverity {
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
```

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```
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmNotificationType {
  ACTIVE = "ACTIVE",
  TRIGGERED = "TRIGGERED",
  SEVERITY_INCREASED = "SEVERITY_INCREASED",
  VALUE_UPDATED = "VALUE_UPDATED",
  ACKNOWLEDGED = "ACKNOWLEDGED",
  CLEARED = "CLEARED",
  RTN = "RTN",
  SHELVED = "SHELVED",
  UNSHELVED = "UNSHELVED",
  RESET = "RESET",
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

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```
enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}
```

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```
enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}

enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",

  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

3.4 Edit Alarm

Update an alarm

URI Template

```
PATCH /api/processors/{instance}/{processor}/alarms/{name*}/{seqnum}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name*} Alarm name.

{seqnum}

Request Body

```
interface EditAlarmRequest {

  // **Required.** The state of the alarm. Either ``acknowledged``
  // or ``unacknowledged``.
  state: string;

  // Message documenting the alarm change.
  comment: string;

  //shelve time in milliseconds (if the state = shelved)
  //can be left out which means it is shelved indefinitely
  shelveDuration: string;  // String decimal
}
```

Related Types

3.5 Subscribe Global Status

Receive alarm status updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `global-alarm-status`.

Input Type

```
interface SubscribeGlobalStatusRequest {
  instance: string;
  processor: string;
}
```

Output Type

```
interface GlobalAlarmStatus {
  unacknowledgedCount: number;
  unacknowledgedActive: boolean;
  acknowledgedCount: number;
  acknowledgedActive: boolean;
  shelvedCount: number;
  shelvedActive: boolean;
}
```

Related Types

3.6 Subscribe Alarms

Receive alarm updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `alarms`.

Input Type

```
interface SubscribeAlarmsRequest {
  instance: string;
  processor: string;
}
```

Output Type

```
// Summary of an alarm applicable for Parameter or Event (possibly
// other in the future) alarms.
// Contains detailed information on the value occurrence that initially
// triggered the alarm, the most severe value since it originally triggered,
// and the latest value at the time of your request.
interface AlarmData {
  type: AlarmType;
  triggerTime: string;  // RFC 3339

  // For parameter alarms, this is the id of the parameters
  // For event alarms
  //   - the id.namespace is /yamcs/event/<EVENT_SOURCE>, unless
  //     EVENT_SOURCE starts with a "/" in which case the namespace
  //     is just the <EVENT_SOURCE>
  //   - the id.name is the <EVENT_TYPE>
  id: NamedObjectId;

  // Distinguisher between multiple alarms for the same id
  seqNum: number;
  severity: AlarmSeverity;

  // Number of times the object was in alarm state
  violations: number;

  // Number of samples received for the object
  count: number;
  acknowledgeInfo: AcknowledgeInfo;
  notificationType: AlarmNotificationType;
  parameterDetail: ParameterAlarmData;
  eventDetail: EventAlarmData;

  // Whether the alarm will stay triggered even when the process is OK
  latching: boolean;

  // if the process that generated the alarm is ok (i.e. parameter is within␣
↪limits)
  processOK: boolean;

  // triggered is same with processOK except when the alarm is latching
  triggered: boolean;

  // if the operator has acknowledged the alarm
  acknowledged: boolean;
```

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```
  // Details in case the alarm was shelved
  shelveInfo: ShelveInfo;
  clearInfo: ClearInfo;
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface AcknowledgeInfo {
  acknowledgedBy: string;
  acknowledgeMessage: string;
  acknowledgeTime: string;  // RFC 3339
}

interface ParameterAlarmData {
  triggerValue: ParameterValue;
  mostSevereValue: ParameterValue;
  currentValue: ParameterValue;
  parameter: ParameterInfo;
}

interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}
```

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```
// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
```

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```
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}
```

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```
interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
```

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```
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
```

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```
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface EventAlarmData {
  triggerEvent: Event;
  mostSevereEvent: Event;
  currentEvent: Event;
}

interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}

interface ShelveInfo {
  shelvedBy: string;
  shelveMessage: string;
  shelveTime: string;  // RFC 3339

  //when the shelving will expire (can be unset which means that it will never␣
↪expire)
  shelveExpiration: string;  // RFC 3339
}

interface ClearInfo {
  clearedBy: string;
  clearTime: string;  // RFC 3339

  //if the alarm has been manually cleared, this is the message provided by the␣
↪operator
  clearMessage: string;
}

enum AlarmType {
  PARAMETER = "PARAMETER",
  EVENT = "EVENT",
}

enum AlarmSeverity {
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
```

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```
}

enum AlarmNotificationType {
  ACTIVE = "ACTIVE",
  TRIGGERED = "TRIGGERED",
  SEVERITY_INCREASED = "SEVERITY_INCREASED",
  VALUE_UPDATED = "VALUE_UPDATED",
  ACKNOWLEDGED = "ACKNOWLEDGED",
  CLEARED = "CLEARED",
  RTN = "RTN",
  SHELVED = "SHELVED",
  UNSHELVED = "UNSHELVED",
  RESET = "RESET",
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
```

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```
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
```

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```
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}

enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",

  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

CHAPTER

FOUR

BUCKETS

Methods related to object storage.

Buckets represent a simple mechanism for storing user objects (binary data chunks such as images, monitoring lists, displays...) together with some metadata. Buckets can be created globally or asociated with an instance.

The metadata is represented by simple (key,value) pairs where both key and value are strings.

By default each user has a bucket named `user.username` which can be used without extra privileges. Additional buckets may be created and used if the user has the required privileges. The user bucket will be created automatically when the user tries to access it.

Buckets can be created at global level or at instance level. The following limitations are implemented in order to prevent disk over consumption and keep the service responsive:

- The maximum size of an upload including data and metadata is 5MB.
- The maximum number of objects in one bucket is 1000.
- The maximum size of an bucket 100MB (counted as the sum of the size of the objects within the bucket).
- The maximum size of the metadata is 16KB (counted as the sum of the length of the keys and values).

4.1 List Buckets

List buckets

URI Template

```
GET /api/buckets/{instance}
```

{instance} Yamcs instance name. Or _global.

Response Type

```
interface ListBucketsResponse {
  buckets: BucketInfo[];
}
```

Related Types

```
interface BucketInfo {

  // Bucket name.
  name: string;

  // Total size in bytes of all objects in the bucket (metadata is not counted)
  size: string;  // String decimal

  // Number of objects in the bucket
  numObjects: number;
}
```

4.2 Create Bucket

Create a bucket

URI Template

```
POST /api/buckets/{instance}
```

{instance} Yamcs instance name. Or _global.

Request Body

```
interface CreateBucketRequest {

  // Bucket name.
  name: string;
}
```

Related Types

```

```

4.3 Delete Bucket

Delete a bucket

Deleting a bucket means also deleting all objects that are part of it.

URI Template

```
DELETE /api/buckets/{instance}/{bucketName}
```

{instance} Yamcs instance name. Or _global.

{bucketName} Bucket name.

Related Types

4.4 Get Object

Get an object

The body of the response represents the object data. The `Content-Type` header is set to the content type of the object specified when uploading the object. If no `Content-Type` was specified when creating the object, the `Content-Type` of the response is set to `application/octet-stream`.

URI Template

```
GET /api/buckets/{instance}/{bucketName}/objects/{objectName*}
```

{instance} Yamcs instance name. Or _global.

{bucketName} Bucket name.

{objectName*} Object name.

Related Types

4.5 Upload Object

Upload an object

Simple upload

In case of simple upload, the objectName has to be specified as part of the URL and the `Content-Type header` has to be set to the type of the object. The body of the request is the object data.

Form upload

The form based upload can be used to upload an object from an HTML form. In this case the Content-Type of the request is set to `multipart/form-data`, and the body will contain at least one part which is the object data. This part includes a filename which is used as the object name as well as a `Content-Type` header. The name attribute for the file part is ignored. Additional parts (which do not specify a filename) will be used as metadata: the name is specified as part of the `Content-Disposition` and the value is the body of the part.

This can be tested with curl using the `-F` option.

Example

```
POST /api/buckets/_global/my_bucket HTTP/1.1
Host: localhost:8090
User-Agent: curl/7.58.0
Accept: */*
Content-Length: 1090
Content-Type: multipart/form-data; boundary=------------------------
↪7109c709802f7ae4

--------------------------7109c709802f7ae4
Content-Disposition: form-data; name="file"; filename="object/name"
Content-Type: text/plain

[object data]
--------------------------7109c709802f7ae4
Content-Disposition: form-data; name="name1"

value1
--------------------------7109c709802f7ae4
Content-Disposition: form-data; name="name2"

value2
--------------------------7109c709802f7ae4--
```

This will create an object named `object/name` with two metadata properties:

```
{
    "name1": "value1",
    "name2": "value2"
}
```

URI Template

```
POST /api/buckets/{instance}/{bucketName}/objects/{objectName**}
```

`{instance}` Yamcs instance name. Or _global.

`{bucketName}` Bucket name.

> If the bucketName is ``user.username`` the bucket will be created automatically if it does not exist. Otherwise the bucket must exist before being used.

`{objectName**}` Object name.

Request Body

```
interface HttpBody {

  // The Content-Type header value for this body.
  // If unspecified, defaults to application/octet-stream
  contentType: string;

  // If set, a Content-Disposition header is added
  // to the response. Weg agents use this to trigger
  // a download.
  filename: string;

  // The body as raw binary
  data: string;  // Base64

  // Any other metadata (used in multipart/form)
  metadata: {[key: string]: string};
}
```

Related Types

4.6 List Objects

List objects

URI Template

```
GET /api/buckets/{instance}/{bucketName}/objects
```

{instance} Yamcs instance name. Or _global.

{bucketName} Bucket name.

Query Parameters

delimiter

Return only objects whose name do not contain the delimiter after the prefix. For the other objects, the response contains (in the prefix response parameter) the name truncated after the delimiter. Duplicates are omitted.

Together with `prefix` this parameter provides filtering capabilities. These work similar to Google Cloud Storage and Amazon S3.

The `delimiter` allows the list to work in a directory mode despite the object namespace being flat. For example if the delimiter is set to "/", then listing the bucket containing objects "a/b", "a/c", "d", "e" and "e/f" returns objects "d" and "e" and prefixes "a/" and "e/".

prefix

List only objects whose name start with prefix

Response Type

```
interface ListObjectsResponse {
  prefixes: string[];
  objects: ObjectInfo[];
}
```

Related Types

```
interface ObjectInfo {

  // Object name
  name: string;

  // Creation time
  created: string;  // RFC 3339

  // Size in bytes
  size: string;  // String decimal
  metadata: {[key: string]: string};
}
```

4.7 Delete Object

Delete an object

URI Template

```
DELETE /api/buckets/{instance}/{bucketName}/objects/{objectName*}
```

{instance} Yamcs instance name. Or _global.

{bucketName} Bucket name.

{objectName*} Object name.

Related Types

CHAPTER

FIVE

CFDP

5.1 List Transfers

List transfers

URI Template

```
GET /api/cfdp/{instance}/transfers
```

{instance} Yamcs instance name.

Response Type

```
interface ListTransfersResponse {
  transfers: TransferInfo[];
}
```

Related Types

```
//message sent as reponse to the info and also when starting a new transfer
interface TransferInfo {

  //unique identifier assigned by the CfdpService
  id: number;
  startTime: string;  // RFC 3339
  state: TransferState;
  bucket: string;
  objectName: string;
  remotePath: string;
  direction: TransferDirection;
  totalSize: string;  // String decimal
  sizeTransferred: string;  // String decimal

  //reliable = true -> class 2 transfer
  //reliable = false -> class 1 transfer
  reliable: boolean;

  //in case the transcation is failed, this provides more information
  failureReason: string;

  // CFDP transaction id;
  // for the incoming transfers it is assigned by the remote peer so therefore␣
↪might not be unique
```

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```
  transactionId: TransactionId;
}

interface TransactionId {
  sequenceNumber: number;
  initiatorEntity: string;  // String decimal
}

enum TransferState {
  RUNNING = "RUNNING",
  PAUSED = "PAUSED",
  FAILED = "FAILED",
  COMPLETED = "COMPLETED",
}

enum TransferDirection {
  UPLOAD = "UPLOAD",
  DOWNLOAD = "DOWNLOAD",
}
```

5.2 Get Transfer

Get a transfer

URI Template

```
GET /api/cfdp/{instance}/transfers/{id}
```

{instance} Yamcs instance name.

{id} Transfer identifier (assigned by Yamcs)

Response Type

```
//message sent as reponse to the info and also when starting a new transfer
interface TransferInfo {

  //unique identifier assigned by the CfdpService
  id: number;
  startTime: string;  // RFC 3339
  state: TransferState;
  bucket: string;
  objectName: string;
  remotePath: string;
  direction: TransferDirection;
  totalSize: string;  // String decimal
  sizeTransferred: string;  // String decimal

  //reliable = true -> class 2 transfer
  //reliable = false -> class 1 transfer
  reliable: boolean;

  //in case the transcation is failed, this provides more information
  failureReason: string;

  // CFDP transaction id;
```

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```
  // for the incoming transfers it is assigned by the remote peer so therefore␣
↪might not be unique
  transactionId: TransactionId;
}
```

Related Types

```
interface TransactionId {
  sequenceNumber: number;
  initiatorEntity: string;  // String decimal
}

enum TransferState {
  RUNNING = "RUNNING",
  PAUSED = "PAUSED",
  FAILED = "FAILED",
  COMPLETED = "COMPLETED",
}

enum TransferDirection {
  UPLOAD = "UPLOAD",
  DOWNLOAD = "DOWNLOAD",
}
```

5.3 Create Transfer

Create a transfer

URI Template

```
POST /api/cfdp/{instance}/transfers
```

{instance}

Request Body

```
interface CreateTransferRequest {

  // **Required** One of ``UPLOAD`` or ``DOWNLOAD``.
  direction: TransferDirection;

  // **Required** The bucket containing the local Yamcs object.
  bucket: string;

  // **Required** The object name in Yamcs bucket storage. For UPLOAD transfers,
  // this object must exist and is what Yamcs will transfer to the remote
  // CFDP entity. For DOWNLOAD transfers, it refers to the object that
  // Yamcs will write to when downloading from a remote CFDP entity.
  objectName: string;

  // **Required** The path at the remote CFDP entity. Example: ``a/local/path/some_
↪filename``.
  remotePath: string;
  downloadOptions: DownloadOptions;
```

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```
  // Configuration options specific to ``UPLOAD`` transfers.
  uploadOptions: UploadOptions;
}
```

Response Type

```
//message sent as reponse to the info and also when starting a new transfer
interface TransferInfo {

  //unique identifier assigned by the CfdpService
  id: number;
  startTime: string;  // RFC 3339
  state: TransferState;
  bucket: string;
  objectName: string;
  remotePath: string;
  direction: TransferDirection;
  totalSize: string;  // String decimal
  sizeTransferred: string;  // String decimal

  //reliable = true -> class 2 transfer
  //reliable = false -> class 1 transfer
  reliable: boolean;

  //in case the transcation is failed, this provides more information
  failureReason: string;

  // CFDP transaction id;
  // for the incoming transfers it is assigned by the remote peer so therefore␣
↪might not be unique
  transactionId: TransactionId;
}
```

Related Types

```
interface DownloadOptions {
}

interface UploadOptions {

  // Set to ``True`` if an already existing destination should be overwritten.
  // Default: ``True``.
  overwrite: boolean;

  // Set to ``True`` if the destination path should be created if it does not␣
↪exist.
  // Default: ``True``.
  createPath: boolean;

  // Set to ``True`` if reliable (class 2) CFDP transfer should be used,
  // otherwise unreliable (class 1). Default: ``False``.
  reliable: boolean;
}

interface TransactionId {
  sequenceNumber: number;
```

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```
  initiatorEntity: string;  // String decimal
}

enum TransferDirection {
  UPLOAD = "UPLOAD",
  DOWNLOAD = "DOWNLOAD",
}

enum TransferState {
  RUNNING = "RUNNING",
  PAUSED = "PAUSED",
  FAILED = "FAILED",
  COMPLETED = "COMPLETED",
}
```

5.4 Pause Transfer

Pause a transfer

URI Template

```
POST /api/cfdp/{instance}/transfers/{id}:pause
```

{instance} Yamcs instance name.

{id} Transfer identifier (assigned by Yamcs)

Related Types

5.5 Cancel Transfer

Cancel a transfer

The ongoing transfer is aborted, partially uploaded/downloaded files are retained.

URI Template

```
POST /api/cfdp/{instance}/transfers/{id}:cancel
```

{instance} Yamcs instance name.

{id} Transfer identifier (assigned by Yamcs)

Related Types

5.6 Resume Transfer

Resume a transfer

URI Template

```
POST /api/cfdp/{instance}/transfers/{id}:resume
```

{instance} Yamcs instance name.

{id} Transfer identifier (assigned by Yamcs)

Related Types

5.7 Subscribe Transfers

Receive transfer updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `cfdp-transfers`.

Input Type

```
interface SubscribeTransfersRequest {

  // Yamcs instance name.
  instance: string;
}
```

Output Type

```
//message sent as reponse to the info and also when starting a new transfer
interface TransferInfo {

  //unique identifier assigned by the CfdpService
  id: number;
  startTime: string;  // RFC 3339
  state: TransferState;
  bucket: string;
  objectName: string;
```

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```
  remotePath: string;
  direction: TransferDirection;
  totalSize: string;  // String decimal
  sizeTransferred: string;  // String decimal

  //reliable = true -> class 2 transfer
  //reliable = false -> class 1 transfer
  reliable: boolean;

  //in case the transcation is failed, this provides more information
  failureReason: string;

  // CFDP transaction id;
  // for the incoming transfers it is assigned by the remote peer so therefore
↪might not be unique
  transactionId: TransactionId;
}
```

Related Types

```
interface TransactionId {
  sequenceNumber: number;
  initiatorEntity: string;  // String decimal
}

enum TransferState {
  RUNNING = "RUNNING",
  PAUSED = "PAUSED",
  FAILED = "FAILED",
  COMPLETED = "COMPLETED",
}

enum TransferDirection {
  UPLOAD = "UPLOAD",
  DOWNLOAD = "DOWNLOAD",
}
```

CHAPTER

SIX

CLEARANCE

6.1 List Clearances

List clearances

URI Template

```
GET /api/clearances
```

Response Type

```
interface ListClearancesResponse {
  clearances: ClearanceInfo[];
}
```

Related Types

```
interface ClearanceInfo {
  username: string;
  level: SignificanceLevelType;
  issuedBy: string;
  issueTime: string;  // RFC 3339
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

6.2 Update Clearance

Update a user's clearance

URI Template

```
PATCH /api/clearances/{username}
```

{username}

Request Body

```
interface UpdateClearanceRequest {
  level: SignificanceLevelType;
}
```

Response Type

```
interface ClearanceInfo {
  username: string;
  level: SignificanceLevelType;
  issuedBy: string;
  issueTime: string;  // RFC 3339
}
```

Related Types

```
enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

6.3 Delete Clearance

Delete a user's clearance

URI Template

```
DELETE /api/clearances/{username}
```

{username}

Related Types

6.4 Subscribe Clearance

Receive updates on own clearance

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `clearance`.

Input Type

```
// A generic empty message that you can re-use to avoid defining duplicated
// empty messages in your APIs. A typical example is to use it as the request
// or the response type of an API method. For instance:
//
//     service Foo {
//       rpc Bar(google.protobuf.Empty) returns (google.protobuf.Empty);
//     }
//
// The JSON representation for `Empty` is empty JSON object `{}`.
interface Empty {
}
```

Output Type

```
interface ClearanceInfo {
  username: string;
  level: SignificanceLevelType;
  issuedBy: string;
  issueTime: string;  // RFC 3339
}
```

Related Types

```
enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

CHAPTER

SEVEN

CLIENTS

Methods for working with 'clients'.

Warning: This API is gradually being phased out and subject to removal. It dates from a time when client software was not knowledgeable about Yamcs and where their state (instance, processor) had to be managed server-side.

7.1 List Clients

List clients

Warning: It is recommended to avoid using this method. It dates from a time when clients were not knowledgeable about Yamcs and their state had to be managed server-side. Nowadays we are favouring stateless APIs and leave state management entirely to the client software.

URI Template

```
GET /api/clients
```

Response Type

```
interface ListClientsResponse {
  clients: ClientInfo[];
}
```

Related Types

```
interface ClientInfo {
  id: number;
  username: string;
  applicationName: string;
  address: string;
  instance: string;
  processorName: string;
  state: ClientState;
  loginTime: string;  // RFC 3339
}
```

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```
enum ClientState {
  CONNECTED = "CONNECTED",
  DISCONNECTED = "DISCONNECTED",
}
```

7.2 Get Client

Get a client

> **Warning:** It is recommended to avoid using this method. It dates from a time when clients were not knowledgeable about Yamcs and their state had to be managed server-side. Nowadays we are favouring stateless APIs and leave state management entirely to the client software.

URI Template

```
GET /api/clients/{id}
```

{id}

Response Type

```
interface ClientInfo {
  id: number;
  username: string;
  applicationName: string;
  address: string;
  instance: string;
  processorName: string;
  state: ClientState;
  loginTime: string;  // RFC 3339
}
```

Related Types

```
enum ClientState {
  CONNECTED = "CONNECTED",
  DISCONNECTED = "DISCONNECTED",
}
```

7.3 Update Client

Update a client

> **Warning:** It is recommended to avoid using this method. It dates from a time when clients were not knowledgeable about Yamcs and their state had to be managed server-side. Nowadays we are favouring stateless APIs and leave state management entirely to the client software.

URI Template

```
PATCH /api/clients/{id}
```

{id}

Request Body

```
interface EditClientRequest {
  instance: string;
  processor: string;
}
```

Related Types

CHAPTER

EIGHT

COMMANDS

8.1 Issue Command

Issue a command

After validating the input parameters, the command will be added to the appropriate command queue for further dispatch.

URI Template

```
POST /api/processors/{instance}/{processor}/commands/{name*}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name*} Command name.

Request Body

```
interface IssueCommandRequest {

  // The name/value assignments for this command.
  assignment: Assignment[];

  // The origin of the command. Typically a hostname.
  origin: string;

  // The sequence number as specified by the origin. This gets
  // communicated back in command history and command queue entries,
  // thereby allowing clients to map local with remote command
  // identities.
  sequenceNumber: number;

  // Whether a response will be returned without actually issuing
  // the command. This is useful when debugging commands.
  // Default ``no``
  dryRun: boolean;

  // Comment attached to this command.
  comment: string;

  // Override the stream on which the command should be sent out.
  // Requires elevated privilege.
  stream: string;

```

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```
  // Disable verification of all transmission constrains (if any
  // specified in the MDB).
  // Requires elevated privilege.
  disableTransmissionConstraints: boolean;

  // Disable all post transmission verifiers (if any specified in the MDB)
  // Requires elevated privilege.
  disableVerifiers: boolean;

  // Override verifier configuration. Keyed by verifier name
  // Requires elevated privilege.
  verifierConfig: {[key: string]: VerifierConfig};

  // Specify custom options for interpretation by non-core extensions.
  // Extensions must register these options against org.yamcs.YamcsServer
  extra: {[key: string]: Value};
}
```

Response Type

```
interface IssueCommandResponse {
  id: string;
  generationTime: string;  // RFC 3339
  origin: string;
  sequenceNumber: number;
  commandName: string;
  source: string;
  hex: string;
  binary: string;  // Base64
  username: string;
  queue: string;
}
```

Related Types

```
interface Assignment {
  name: string;
  value: string;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

8.2 Update Command History

Update command history

URI Template

```
POST /api/processors/{instance}/{processor}/commandhistory/{name*}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name*} Command name.

Request Body

```
interface UpdateCommandHistoryRequest {
  id: string;
  attributes: CommandHistoryAttribute[];
}
```

Related Types

```
interface CommandHistoryAttribute {
  name: string;
  value: Value;
  time: string;  // String decimal
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
```

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```
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

8.3 List Commands

List commands

URI Template

```
GET /api/archive/{instance}/commands
```

{instance} Yamcs instance name.

Query Parameters

pos

The zero-based row number at which to start outputting results. Default: `0`

limit

The maximum number of returned records per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

order

The order of the returned results. Can be either `asc` or `desc`. Default: `desc`

q

Text to search in the name of the command.

next

start

Filter the lower bound of the command's generation time. Specify a date string in ISO 8601 format. This bound is inclusive.

stop

Filter the upper bound of the command's generation time. Specify a date string in ISO 8601 format. This bound is exclusive.

Response Type

```
interface ListCommandsResponse {
  entry: CommandHistoryEntry[];
  continuationToken: string;
}
```

Related Types

```
interface CommandHistoryEntry {
  id: string;
  commandName: string;
  origin: string;
  sequenceNumber: number;
  commandId: CommandId;
  attr: CommandHistoryAttribute[];
  generationTimeUTC: string;
  generationTime: string;  // RFC 3339
  assignment: CommandAssignment[];
}

interface CommandId {
  generationTime: string;  // String decimal
  origin: string;
  sequenceNumber: number;
  commandName: string;
}

interface CommandHistoryAttribute {
  name: string;
  value: Value;
  time: string;  // String decimal
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface CommandAssignment {
```

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```
  name: string;
  value: Value;
  userInput: boolean;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

8.4 Get Command

Get a command

URI Template

```
GET /api/archive/{instance}/commands/{id}
```

{instance}

{id}

Response Type

```
interface CommandHistoryEntry {
  id: string;
  commandName: string;
  origin: string;
  sequenceNumber: number;
  commandId: CommandId;
  attr: CommandHistoryAttribute[];
  generationTimeUTC: string;
  generationTime: string;  // RFC 3339
  assignment: CommandAssignment[];
}
```

Related Types

```
interface CommandId {
  generationTime: string;  // String decimal
  origin: string;
  sequenceNumber: number;
  commandName: string;
}

interface CommandHistoryAttribute {
  name: string;
  value: Value;
  time: string;  // String decimal
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface CommandAssignment {
  name: string;
  value: Value;
  userInput: boolean;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
```

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```
  ENUMERATED = "ENUMERATED",
}
```

8.5 Stream Commands

Streams back commands

Warning: This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/stream-archive/{instance}:streamCommands
```

{instance}

Request Body

```
interface StreamCommandsRequest {
  start: string;  // RFC 3339
  stop: string;  // RFC 3339
  name: string[];
}
```

Response Type

```
interface CommandHistoryEntry {
  id: string;
  commandName: string;
  origin: string;
  sequenceNumber: number;
  commandId: CommandId;
  attr: CommandHistoryAttribute[];
  generationTimeUTC: string;
  generationTime: string;  // RFC 3339
  assignment: CommandAssignment[];
}
```

Related Types

```
interface CommandId {
  generationTime: string;  // String decimal
  origin: string;
  sequenceNumber: number;
  commandName: string;
}

interface CommandHistoryAttribute {
  name: string;
  value: Value;
```

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```
  time: string;  // String decimal
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface CommandAssignment {
  name: string;
  value: Value;
  userInput: boolean;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

8.6 Subscribe Commands

Receive updates on issued commands

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `commands`.

Input Type

```
interface SubscribeCommandsRequest {
  instance: string;
  processor: string;
  ignorePastCommands: boolean;
}
```

Output Type

```
interface CommandHistoryEntry {
  id: string;
  commandName: string;
  origin: string;
  sequenceNumber: number;
  commandId: CommandId;
  attr: CommandHistoryAttribute[];
  generationTimeUTC: string;
  generationTime: string;  // RFC 3339
  assignment: CommandAssignment[];
}
```

Related Types

```
interface CommandId {
  generationTime: string;  // String decimal
  origin: string;
  sequenceNumber: number;
  commandName: string;
}

interface CommandHistoryAttribute {
  name: string;
  value: Value;
  time: string;  // String decimal
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
```

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```
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface CommandAssignment {
  name: string;
  value: Value;
  userInput: boolean;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

CHAPTER

NINE

COP1

Methods for virtual channel TC links that have `useCop1: true`. This service contains methods for setting/getting the configuration and performing various operations in addition a websocket subscription is available that will allow receiving periodically the status.

9.1 Initialize

Initialize COP-1 in case state is UNITIALIZED

URI Template

```
POST /api/cop1/{instance}/{link}:initialize
```

{instance} Yamcs instance name.

{link} Link name.

Request Body

```
interface InitializeRequest {
  type: InitializationType;

  // Timeout in milliseconds for initialize with CLCW check
  clcwCheckInitializeTimeout: string;  // String decimal

  //vR value for initialize with set V(R)
  vR: number;
}
```

Related Types

```
enum InitializationType {

  // CLCW will be expected from the remote system and used to initiate the vS
  WITH_CLCW_CHECK = "WITH_CLCW_CHECK",

  // Initiate without waiting for CLCW
  WITHOUT_CLCW_CHECK = "WITHOUT_CLCW_CHECK",

  // This causes a BC Unlock frame to be sent to the remote system.
  UNLOCK = "UNLOCK",

  // Initiate AD with set V(R). This will cause a BC frame to be sent to the␣
↪remote system
```

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```
  SET_VR = "SET_VR",
}
```

9.2 Resume

Resume COP-1 operation in case state is SUSPENDED

URI Template

```
POST /api/cop1/{instance}/{link}:resume
```

{instance} Yamcs instance name.

{link} Link name.

Related Types

9.3 Disable

Disable COP-1 operation

This causes the sent queue to be purged. All TCs from the wait queue, as well as newly received TCs are sent immediately

URI Template

```
POST /api/cop1/{instance}/{link}:disable
```

{instance} Yamcs instance name.

{link} Link name.

Request Body

```
interface DisableRequest {

  // If true, all transmitted frames while COP1 is disabled, have the bypass flag␣
↪set
  setBypassAll: boolean;
}
```

Related Types

9.4 Update Config

Update configuration settings

URI Template

```
PATCH /api/cop1/{instance}/{link}/config
```

{instance} Yamcs instance name.

{link} Link name.

Request Body

```
interface Cop1Config {
  vcId: number;

  // If true, the BD frames are sent immediately, without going to the waiting␣
↪queue
  bdAbsolutePriority: boolean;

  // Maximum size of the sent queue (i.e. how many unacknowledged frames can be in␣
↪the
  // queue before timing out)
  windowWidth: number;

  // What should happen on timeout: go to SUSPEND or go to UNINITIALIZED
  timeoutType: TimeoutType;

  // How many times the frames are transmitted before timing out
  txLimit: number;

  // How many milliseconds to wait between retransmissions
  t1: string;  // String decimal
}
```

Response Type

```
interface Cop1Config {
  vcId: number;

  // If true, the BD frames are sent immediately, without going to the waiting␣
↪queue
  bdAbsolutePriority: boolean;

  // Maximum size of the sent queue (i.e. how many unacknowledged frames can be in␣
↪the
  // queue before timing out)
  windowWidth: number;

  // What should happen on timeout: go to SUSPEND or go to UNINITIALIZED
```

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```
  timeoutType: TimeoutType;

  // How many times the frames are transmitted before timing out
  txLimit: number;

  // How many milliseconds to wait between retransmissions
  t1: string;  // String decimal
}
```

Related Types

```
enum TimeoutType {
  UNINITIALIZE = "UNINITIALIZE",
  SUSPEND = "SUSPEND",
}
```

9.5 Get Config

Get COP-1 configuration

URI Template

```
GET /api/cop1/{instance}/{link}/config
```

{instance} Yamcs instance name.

{link} Link name.

Response Type

```
interface Cop1Config {
  vcId: number;

  // If true, the BD frames are sent immediately, without going to the waiting␣
↪queue
  bdAbsolutePriority: boolean;

  // Maximum size of the sent queue (i.e. how many unacknowledged frames can be in␣
↪the
  // queue before timing out)
  windowWidth: number;

  // What should happen on timeout: go to SUSPEND or go to UNINITIALIZED
  timeoutType: TimeoutType;

  // How many times the frames are transmitted before timing out
  txLimit: number;

  // How many milliseconds to wait between retransmissions
  t1: string;  // String decimal
}
```

Related Types

```
enum TimeoutType {
  UNINITIALIZE = "UNINITIALIZE",
  SUSPEND = "SUSPEND",
}
```

9.6 Get Status

Get COP-1 status

URI Template

```
GET /api/cop1/{instance}/{link}/status
```

{instance} Yamcs instance name.

{link} Link name.

Response Type

```
interface Cop1Status {

  // Link name for which this status applies.
  // It is present when this message is sent over the websocket as there might
  // be multiple COP-1 links subscribed
  link: string;

  // If false, all frames are immediately transmitted (i.e. COP-1 is disabled)
  cop1Active: boolean;

  // Relevant if cop1Active = false -> set the bypass flag on all outgoing frames
  setBypassAll: boolean;

  // Last received CLCW
  clcw: Clcw;

  // Current state of FOP-1 state machine, only relevant if cop1Active = true
  state: Cop1State;

  // V(S) - Transmitter Frame Sequence Number;
  vS: number;

  // The nR from the previous CLCW
  nnR: number;

  // Number of TC packets in the wait queue
  waitQueueNumTC: number;

  // Number of unacknowledged frames in the sent queue
  sentQueueNumFrames: number;

  // Number of frames in the out queue (waiting to be picked up by the master chain
  // multiplexer)
  outQueueNumFrames: number;

  // How many times the last frame has been transmitted
```

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```
  txCount: number;
}
```

Related Types

```
interface Clcw {
  receptionTime: string;  // RFC 3339
  lockout: boolean;
  wait: boolean;
  retransmit: boolean;
  nR: number;
}

enum Cop1State {
  ACTIVE = "ACTIVE",
  RETRANSMIT_WITHOUT_WAIT = "RETRANSMIT_WITHOUT_WAIT",
  RETRANSMIT_WITH_WAIT = "RETRANSMIT_WITH_WAIT",
  INITIALIZING_WITHOUT_BC = "INITIALIZING_WITHOUT_BC",
  INITIALIZING_WITH_BC = "INITIALIZING_WITH_BC",
  UNINITIALIZED = "UNINITIALIZED",
  SUSPENDED = "SUSPENDED",
}
```

9.7 Subscribe Status

Receive COP-1 status updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `cop1`.

Input Type

```
interface SubscribeStatusRequest {

  // Yamcs instance name.
  instance: string;

  // Link name.
  link: string;
}
```

Output Type

```
interface Cop1Status {

  // Link name for which this status applies.
  // It is present when this message is sent over the websocket as there might
  // be multiple COP-1 links subscribed
  link: string;

  // If false, all frames are immediately transmitted (i.e. COP-1 is disabled)
  cop1Active: boolean;

  // Relevant if cop1Active = false -> set the bypass flag on all outgoing frames
  setBypassAll: boolean;

  // Last received CLCW
  clcw: Clcw;

  // Current state of FOP-1 state machine, only relevant if cop1Active = true
  state: Cop1State;

  // V(S) - Transmitter Frame Sequence Number;
  vS: number;

  // The nR from the previous CLCW
  nnR: number;

  // Number of TC packets in the wait queue
  waitQueueNumTC: number;

  // Number of unacknowledged frames in the sent queue
  sentQueueNumFrames: number;

  // Number of frames in the out queue (waiting to be picked up by the master chain
  // multiplexer)
  outQueueNumFrames: number;

  // How many times the last frame has been transmitted
  txCount: number;
}
```

Related Types

```
interface Clcw {
  receptionTime: string;  // RFC 3339
  lockout: boolean;
  wait: boolean;
  retransmit: boolean;
  nR: number;
}

enum Cop1State {
  ACTIVE = "ACTIVE",
  RETRANSMIT_WITHOUT_WAIT = "RETRANSMIT_WITHOUT_WAIT",
  RETRANSMIT_WITH_WAIT = "RETRANSMIT_WITH_WAIT",
  INITIALIZING_WITHOUT_BC = "INITIALIZING_WITHOUT_BC",
  INITIALIZING_WITH_BC = "INITIALIZING_WITH_BC",
  UNINITIALIZED = "UNINITIALIZED",
  SUSPENDED = "SUSPENDED",
}
```

CHAPTER

TEN

EVENTS

10.1 List Events

List events

URI Template

```
GET /api/archive/{instance}/events
```

{instance} Yamcs instance name.

Query Parameters

pos

The zero-based row number at which to start outputting results. Default: `0`

limit

The maximum number of returned records per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

order

The order of the returned results. Can be either `asc` or `desc`. Default: `desc`

severity

The minimum severity level of the events. One of `info`, `watch`, `warning`, `distress`, `critical` or `severe`. Default: `info`

source

The source of the events. Names must match exactly.

next

start

Filter the lower bound of the event's generation time. Specify a date string in ISO 8601 format. This bound is inclusive.

stop

Filter the upper bound of the event's generation time. Specify a date string in ISO 8601 format. This bound is exclusive.

q

Text to search for in the message.

Response Type

```
interface ListEventsResponse {
  event: Event[];
  continuationToken: string;
}
```

Related Types

```
interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}

enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",

  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

10.2 Create Event

Create an event

URI Template

```
POST /api/archive/{instance}/events
```

{instance} Yamcs instance name.

Request Body

```
interface CreateEventRequest {

  // Description of the type of the event. Useful for quick classification or␣
↪filtering.
  type: string;

  // **Required.** Event message.
  message: string;

  // The severity level of the event. One of ``info``, ``watch``, ``warning``,
  // ``distress``, ``critical`` or ``severe``. Default is ``info``
  severity: string;

  // Time associated with the event.
  // If unspecified, this will default to the current mission time.
  time: string;  // RFC 3339

  // Source of the event. Useful for grouping events in the archive. Default is
  // ``User``.
  source: string;

  // Sequence number of this event. This is primarily used to determine unicity of
  // events coming from the same source. If not set Yamcs will automatically
  // assign a sequential number as if every submitted event is unique.
  sequenceNumber: number;
}
```

Response Type

```
interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}
```

Related Types

```
enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",

  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
```

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```
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

10.3 List Event Sources

List event sources

URI Template

```
GET /api/archive/{instance}/events/sources
```

{instance} Yamcs instance name.

Response Type

```
interface ListEventSourcesResponse {
  source: string[];
}
```

Related Types

10.4 Stream Events

Streams back events

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/stream-archive/{instance}:streamEvents
```

{instance} Yamcs instance name.

Request Body

```
interface StreamEventsRequest {
  start: string;  // RFC 3339
  stop: string;  // RFC 3339
  source: string[];
  severity: string;
  q: string;
}
```

Response Type

```
interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}
```

Related Types

```
enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",

  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

10.5 Export Events

Export events in CSV format

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
GET /api/archive/{instance}:exportEvents
```

{instance} Yamcs instance name.

Query Parameters

start

Filter the lower bound of the event's generation time. Specify a date string in ISO 8601 format. This bound is inclusive.

stop

Filter the upper bound of the event's generation time. Specify a date string in ISO 8601 format. This bound is exclusive.

source

The source of the events. Names must match exactly.

severity

The minimum severity level of the events. One of `info`, `watch`, `warning`, `distress` or `severe`. Default: `info`

q

Text to search for in the message.

Related Types

10.6 Subscribe Events

Receive event updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `events`.

Input Type

```
interface SubscribeEventsRequest {
  instance: string;
}
```

Output Type

```
interface Event {
  source: string;
  generationTime: string;  // RFC 3339
  receptionTime: string;  // RFC 3339
  seqNumber: number;
  type: string;
  message: string;
  severity: EventSeverity;
  generationTimeUTC: string;
  receptionTimeUTC: string;

  // Set by API when event was posted by a user
  createdBy: string;
}
```

Related Types

```
enum EventSeverity {
  INFO = "INFO",
  WARNING = "WARNING",
  ERROR = "ERROR",

  //the levels below are compatible with XTCE
  // we left the 4 out since it could be used
  // for warning if we ever decide to get rid of the old ones
  WATCH = "WATCH",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

CHAPTER

ELEVEN

IAM

Handles incoming requests related to Identity and Access Management (IAM)

11.1 List Privileges

List privileges

URI Template

```
GET /api/privileges
```

Response Type

```
interface ListPrivilegesResponse {
  systemPrivileges: string[];
}
```

Related Types

```

```

11.2 List Roles

List roles

URI Template

```
GET /api/roles
```

Response Type

```
interface ListRolesResponse {
  roles: RoleInfo[];
}
```

Related Types

```
interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}
```

11.3 Get Role

Get a role

URI Template

```
GET /api/roles/{name}
```

{name}

Response Type

```
interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}
```

Related Types

```
interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}
```

11.4 Delete Role Assignment

Delete a role assignment

URI Template

```
DELETE /api/users/{name}/roles/{role}
```

{name}

{role}

Related Types

11.5 List Users

List users

URI Template

```
GET /api/users
```

Response Type

```
interface ListUsersResponse {
  users: UserInfo[];
}
```

Related Types

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}

interface ObjectPrivilegeInfo {
```

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```
  type: string;
  object: string[];
}

interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.6 Get User

Get a user

URI Template

```
GET /api/users/{name}
```

{name}

Response Type

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}
```

Related Types

```
interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
```

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```
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.7 Create User

Create a user

URI Template

```
POST /api/users
```

Request Body

```
interface CreateUserRequest {
  name: string;
  displayName: string;
  email: string;
  password: string;
}
```

Response Type

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}
```

Related Types

```
interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.8 Update User

Update a user

URI Template

```
PATCH /api/users/{name}
```

{name}

Request Body

```
interface UpdateUserRequest {
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  password: string;
  roleAssignment: RoleAssignment;
}
```

Response Type

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}
```

Related Types

```
interface RoleAssignment {
  roles: string[];
}

interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface ServiceAccountInfo {
  name: string;
```

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```
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.9 Get Own User

Get own user

URI Template

```
GET /api/user
```

Response Type

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}
```

Related Types

```
interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.10 Delete Identity

Delete an external identity

URI Template

```
DELETE /api/users/{name}/identities/{provider}
```

{name}

{provider}

Related Types

11.11 List Groups

List groups

URI Template

```
GET /api/groups
```

Response Type

```
interface ListGroupsResponse {
  groups: GroupInfo[];
}
```

Related Types

```
interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}
```

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```
interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.12 Get Group

Get a group

URI Template

```
GET /api/groups/{name}
```

{name}

Response Type

```
interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}
```

Related Types

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}

interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
```

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```
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.13 Create Group

Create a group

URI Template

```
POST /api/groups
```

Request Body

```
interface CreateGroupRequest {
  name: string;
  description: string;
  users: string[];
  serviceAccounts: string[];
}
```

Response Type

```
interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}
```

Related Types

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}
```

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```
interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.14 Update Group

Update a group

URI Template

```
PATCH /api/groups/{name}
```

{name}

Request Body

```
interface UpdateGroupRequest {
  newName: string;
  description: string;
  memberInfo: MemberInfo;
}
```

Response Type

```
interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}
```

Related Types

```
interface MemberInfo {
  users: string[];
  serviceAccounts: string[];
}

interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}

interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}
```

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```
interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.15 Delete Group

Delete a group

URI Template

```
DELETE /api/groups/{name}
```

{name}

Response Type

```
interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}
```

Related Types

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
```

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```
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}

interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.16 List Service Accounts

List service accounts

URI Template

```
GET /api/service-accounts
```

Response Type

```
interface ListServiceAccountsResponse {
  serviceAccounts: ServiceAccountInfo[];
}
```

Related Types

```
interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}

interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
  clearance: SignificanceLevelType;
}

interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
```

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```
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.17 Get Service Account

Get a service account

URI Template

```
GET /api/service-accounts/{name}
```

{name}

Response Type

```
interface ServiceAccountInfo {
  name: string;
  displayName: string;
  active: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
}
```

Related Types

```
interface UserInfo {
  name: string;
  displayName: string;
  email: string;
  active: boolean;
  superuser: boolean;
  createdBy: UserInfo;
  creationTime: string;  // RFC 3339
  confirmationTime: string;  // RFC 3339
  lastLoginTime: string;  // RFC 3339
  systemPrivilege: string[];
  objectPrivilege: ObjectPrivilegeInfo[];
  groups: GroupInfo[];
  identities: ExternalIdentityInfo[];
  roles: RoleInfo[];
```

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```
  clearance: SignificanceLevelType;
}

interface ObjectPrivilegeInfo {
  type: string;
  object: string[];
}

interface GroupInfo {
  name: string;
  description: string;
  users: UserInfo[];
  serviceAccounts: ServiceAccountInfo[];
}

interface ExternalIdentityInfo {
  identity: string;
  provider: string;
}

interface RoleInfo {
  name: string;
  description: string;
  systemPrivileges: string[];
  objectPrivileges: ObjectPrivilegeInfo[];
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

11.18 Delete Service Account

Delete a service account

URI Template

```
DELETE /api/service-accounts/{name}
```

{name}

Related Types

11.19 Create Service Account

Create a service account

URI Template

```
POST /api/service-accounts
```

Request Body

```
interface CreateServiceAccountRequest {
  name: string;
}
```

Response Type

```
interface CreateServiceAccountResponse {
  name: string;
  applicationId: string;
  applicationSecret: string;
}
```

Related Types

CHAPTER

TWELVE

INDEXES

12.1 List Command History Index

List command history index

URI Template

```
GET /api/archive/{instance}/command-index
```

{instance} Yamcs instance name.

Query Parameters

mergeTime

Value in milliseconds that indicates the maximum gap before two consecutive index ranges are merged together. Default: `2000`

limit

The maximum number of returned entries. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `1000`. Note that in general it is advised to control the size of the response via `mergeTime`, rather than via `limit`.

start

Filter the lower bound of the index entries. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the index entries. Specify a date string in ISO 8601 format.

next

name

Response Type

```
interface IndexResponse {
  group: IndexGroup[];
  continuationToken: string;
}
```

Related Types

```
interface IndexGroup {
  id: NamedObjectId;
  entry: IndexEntry[];
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface IndexEntry {
  start: string;
  stop: string;
  count: number;
  seqStart: string;  // String decimal
  seqStop: string;  // String decimal
}
```

12.2 List Event Index

List event index

URI Template

```
GET /api/archive/{instance}/event-index
```

{instance} Yamcs instance name.

Query Parameters

mergeTime

Value in milliseconds that indicates the maximum gap before two consecutive index ranges are merged together. Default: `2000`

limit

The maximum number of returned entries. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `1000`. Note that in general it is advised to control the size of the response via `mergeTime`, rather than via `limit`.

start

Filter the lower bound of the index entries. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the index entries. Specify a date string in ISO 8601 format.

next

source

Response Type

```
interface IndexResponse {
  group: IndexGroup[];
  continuationToken: string;
}
```

Related Types

```
interface IndexGroup {
  id: NamedObjectId;
  entry: IndexEntry[];
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface IndexEntry {
  start: string;
  stop: string;
  count: number;
  seqStart: string;  // String decimal
  seqStop: string;  // String decimal
}
```

12.3 List Packet Index

List packet index

URI Template

```
GET /api/archive/{instance}/packet-index
```

{instance} Yamcs instance name.

Query Parameters

mergeTime

Value in milliseconds that indicates the maximum gap before two consecutive index ranges are merged together. Default: `2000`

limit

The maximum number of returned entries. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `1000`. Note that in general it is advised to control the size of the response via `mergeTime`, rather than via `limit`.

start

Filter the lower bound of the index entries. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the index entries. Specify a date string in ISO 8601 format.

next

name

Response Type

```
interface IndexResponse {
  group: IndexGroup[];
  continuationToken: string;
}
```

Related Types

```
interface IndexGroup {
  id: NamedObjectId;
  entry: IndexEntry[];
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface IndexEntry {
  start: string;
  stop: string;
  count: number;
  seqStart: string;  // String decimal
  seqStop: string;  // String decimal
}
```

12.4 List Parameter Index

List parameter index

URI Template

```
GET /api/archive/{instance}/parameter-index
```

{instance} Yamcs instance name.

Query Parameters

mergeTime

Value in milliseconds that indicates the maximum gap before two consecutive index ranges are merged together. Default: `20000`

limit

The maximum number of returned entries. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `1000`. Note that in general it is advised to control the size of the response via `mergeTime`, rather than via `limit`.

start

Filter the lower bound of the index entries. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the index entries. Specify a date string in ISO 8601 format.

next

group

Response Type

```
interface IndexResponse {
  group: IndexGroup[];
  continuationToken: string;
}
```

Related Types

```
interface IndexGroup {
  id: NamedObjectId;
  entry: IndexEntry[];
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface IndexEntry {
  start: string;
  stop: string;
  count: number;
  seqStart: string;  // String decimal
  seqStop: string;  // String decimal
}
```

12.5 List Completeness Index

List completeness index

URI Template

```
GET /api/archive/{instance}/completeness-index
```

{instance} Yamcs instance name.

Query Parameters

limit

The maximum number of returned entries. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `1000`. Note that in general it is advised to control the size of the response via `mergeTime`, rather than via `limit`.

start

Filter the lower bound of the index entries. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the index entries. Specify a date string in ISO 8601 format.

next

Response Type

```
interface IndexResponse {
  group: IndexGroup[];
  continuationToken: string;
}
```

Related Types

```
interface IndexGroup {
  id: NamedObjectId;
  entry: IndexEntry[];
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface IndexEntry {
  start: string;
  stop: string;
  count: number;
  seqStart: string;  // String decimal
  seqStop: string;  // String decimal
}
```

12.6 Stream Index

Streams back index records

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}:streamIndex
```

{instance} Yamcs instance name.

Request Body

```
interface StreamIndexRequest {

  // The time at which to start retrieving index records.
  start: string;  // RFC 3339

  // The time at which to stop retrieving index records.
  stop: string;  // RFC 3339

  // The type of indexes to retrieve. Choose out of ``tm``, ``pp``,
  // ``events``, ``commands`` or ``completeness``. By default all
  // indexes are sent.
  filters: string[];

  // Specify exact names for the TM packets for which you want to
  // retrieve index records. Setting this parameter, automatically
  // implies that ``tm`` is added to the filter.
  packetnames: string[];
}
```

Response Type

```
interface IndexResult {
  records: ArchiveRecord[];

  //type can be histogram or completeness
  type: string;

  //if type=histogram, the tableName is the table for which the histogram is sent
  tableName: string;
}
```

Related Types

```
//contains histogram data
interface ArchiveRecord {
  id: NamedObjectId;
  num: number;
  seqFirst: string;  // String decimal
  seqLast: string;  // String decimal
  first: string;  // RFC 3339
  last: string;  // RFC 3339
  extra: {[key: string]: string};
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

12.7 Stream Packet Index

Streams back packet index records

Warning: This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}:streamPacketIndex
```

{instance} Yamcs instance name.

Request Body

```
interface StreamPacketIndexRequest {

  // The time at which to start retrieving index records.
  start: string;  // RFC 3339

  // The time at which to stop retrieving index records.
  stop: string;  // RFC 3339
  names: string[];
}
```

Response Type

```
//contains histogram data
interface ArchiveRecord {
  id: NamedObjectId;
  num: number;
  seqFirst: string;  // String decimal
  seqLast: string;  // String decimal
  first: string;  // RFC 3339
  last: string;  // RFC 3339
  extra: {[key: string]: string};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

12.8 Stream Parameter Index

Streams back parameter index records

Warning: This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}:streamParameterIndex
```

{instance} Yamcs instance name.

Request Body

```
interface StreamParameterIndexRequest {

  // The time at which to start retrieving index records.
  start: string;  // RFC 3339

  // The time at which to stop retrieving index records.
  stop: string;  // RFC 3339
}
```

Response Type

```
//contains histogram data
interface ArchiveRecord {
  id: NamedObjectId;
  num: number;
  seqFirst: string;  // String decimal
  seqLast: string;  // String decimal
  first: string;  // RFC 3339
  last: string;  // RFC 3339
  extra: {[key: string]: string};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

12.9 Stream Command Index

Streams back processed parameter index records

Warning: This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}:streamCommandIndex
```

{instance} Yamcs instance name.

Request Body

```
interface StreamCommandIndexRequest {

  // The time at which to start retrieving index records.
  start: string;  // RFC 3339

  // The time at which to stop retrieving index records.
  stop: string;  // RFC 3339
}
```

Response Type

```
//contains histogram data
interface ArchiveRecord {
  id: NamedObjectId;
  num: number;
  seqFirst: string;  // String decimal
  seqLast: string;  // String decimal
  first: string;  // RFC 3339
  last: string;  // RFC 3339
  extra: {[key: string]: string};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

12.10 Stream Event Index

Streams back event index records

Warning: This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}:streamEventIndex
```

{instance} Yamcs instance name.

Request Body

```
interface StreamEventIndexRequest {

  // The time at which to start retrieving index records.
  start: string;  // RFC 3339

  // The time at which to stop retrieving index records.
  stop: string;  // RFC 3339
}
```

Response Type

```
//contains histogram data
interface ArchiveRecord {
  id: NamedObjectId;
  num: number;
  seqFirst: string;  // String decimal
  seqLast: string;  // String decimal
  first: string;  // RFC 3339
  last: string;  // RFC 3339
  extra: {[key: string]: string};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

12.11 Stream Completeness Index

Streams back event index records

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}:streamCompletenessIndex
```

{instance} Yamcs instance name.

Request Body

```
interface StreamCompletenessIndexRequest {

  // The time at which to start retrieving index records.
  start: string;  // RFC 3339

  // The time at which to stop retrieving index records.
  stop: string;  // RFC 3339
}
```

Response Type

```
//contains histogram data
interface ArchiveRecord {
  id: NamedObjectId;
  num: number;
  seqFirst: string;  // String decimal
  seqLast: string;  // String decimal
  first: string;  // RFC 3339
  last: string;  // RFC 3339
  extra: {[key: string]: string};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

12.12 Rebuild Ccsds Index

Rebuild CCSDS TM Index

URI Template

```
POST /api/archive/{instance}:rebuildCcsdsIndex
```

{instance} Yamcs instance name.

Request Body

```
interface RebuildCcsdsIndexRequest {
  start: string;  // RFC 3339
  stop: string;  // RFC 3339
}
```

Related Types

```

```

CHAPTER

THIRTEEN

MANAGEMENT

13.1 Get System Info

Get system info

URI Template

```
GET /api/sysinfo
```

Response Type

```
interface SystemInfo {
  yamcsVersion: string;
  revision: string;
  serverId: string;
  uptime: string;  // String decimal
  jvm: string;
  workingDirectory: string;
  configDirectory: string;
  dataDirectory: string;
  cacheDirectory: string;
  os: string;
  arch: string;
  availableProcessors: number;
  loadAverage: number;
  heapMemory: string;  // String decimal
  usedHeapMemory: string;  // String decimal
  maxHeapMemory: string;  // String decimal
  nonHeapMemory: string;  // String decimal
  usedNonHeapMemory: string;  // String decimal
  maxNonHeapMemory: string;  // String decimal
  jvmThreadCount: string;  // String decimal
  rootDirectories: RootDirectory[];
}
```

Related Types

```
interface RootDirectory {
  directory: string;
  type: string;
  totalSpace: string;  // String decimal
  unallocatedSpace: string;  // String decimal
  usableSpace: string;  // String decimal
}
```

13.2 List Instance Templates

List instance templates

URI Template

```
GET /api/instance-templates
```

Response Type

```
interface ListInstanceTemplatesResponse {
  templates: InstanceTemplate[];
}
```

Related Types

```
interface InstanceTemplate {

  // Template name.
  name: string;

  // Human-friendly description
  description: string;

  // List of variables that this template may expect
  variables: TemplateVariable[];
}

interface TemplateVariable {

  // Variable name.
  name: string;

  // Verbose name for use in UI forms
  label: string;

  // Type of variable (Java class extending org.yamcs.templating.Variable)
  type: string;

  // Verbose user guidance (HTML)
  help: string;

  // Whether this variable is required input
  required: boolean;
```

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```
  // List of valid choices
  choices: string[];

  // Initial value for use in UI forms
  initial: string;
}
```

13.3 Get Instance Template

Get an instance template

URI Template

```
GET /api/instance-templates/{template}
```

{template} Template name.

Response Type

```
interface InstanceTemplate {

  // Template name.
  name: string;

  // Human-friendly description
  description: string;

  // List of variables that this template may expect
  variables: TemplateVariable[];
}
```

Related Types

```
interface TemplateVariable {

  // Variable name.
  name: string;

  // Verbose name for use in UI forms
  label: string;

  // Type of variable (Java class extending org.yamcs.templating.Variable)
  type: string;

  // Verbose user guidance (HTML)
  help: string;

  // Whether this variable is required input
  required: boolean;

  // List of valid choices
  choices: string[];
```

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```
  // Initial value for use in UI forms
  initial: string;
}
```

13.4 List Instances

List instances

URI Template

```
GET /api/instances
```

Query Parameters

filter

Response Type

```
interface ListInstancesResponse {
  instances: YamcsInstance[];
}
```

Related Types

```
interface YamcsInstance {

  // Instance name.
  name: string;
  missionDatabase: MissionDatabase;
  processors: ProcessorInfo[];
  state: InstanceState;

  //in case the state=FAILED, this field will indicate the cause of the failure
  // the missionDatabase and other fields may not be filled when this happens
  failureCause: string;
  missionTime: string;  // RFC 3339
  labels: {[key: string]: string};
}

interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
```

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```
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}

interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}

interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;
```

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```
  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
```

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```
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum InstanceState {
  OFFLINE = "OFFLINE",
  INITIALIZING = "INITIALIZING",
  INITIALIZED = "INITIALIZED",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
```

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```
  FAILED = "FAILED",
}
```

13.5 Subscribe Instances

Receive instance updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `instances`.

Input Type

```
// A generic empty message that you can re-use to avoid defining duplicated
// empty messages in your APIs. A typical example is to use it as the request
// or the response type of an API method. For instance:
//
//     service Foo {
//       rpc Bar(google.protobuf.Empty) returns (google.protobuf.Empty);
//     }
//
// The JSON representation for `Empty` is empty JSON object `{}`.
interface Empty {
}
```

Output Type

```
interface YamcsInstance {

  // Instance name.
  name: string;
  missionDatabase: MissionDatabase;
  processors: ProcessorInfo[];
  state: InstanceState;

  //in case the state=FAILED, this field will indicate the cause of the failure
  // the missionDatabase and other fields may not be filled when this happens
  failureCause: string;
  missionTime: string;  // RFC 3339
  labels: {[key: string]: string};
}
```

Related Types

```
interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}

interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}

interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {
```

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```
  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
```

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```
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
```

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```
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum InstanceState {
  OFFLINE = "OFFLINE",
  INITIALIZING = "INITIALIZING",
  INITIALIZED = "INITIALIZED",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  FAILED = "FAILED",
}
```

13.6 Get Instance

Get an instance

If an instance does not have web services enabled, it will be listed among the results, but none of its URLs will be filled in.

URI Template

```
GET /api/instances/{instance}
```

{instance} Yamcs instance name.

Response Type

```
interface YamcsInstance {

  // Instance name.
  name: string;
  missionDatabase: MissionDatabase;
  processors: ProcessorInfo[];
  state: InstanceState;

  //in case the state=FAILED, this field will indicate the cause of the failure
  // the missionDatabase and other fields may not be filled when this happens
  failureCause: string;
  missionTime: string;  // RFC 3339
  labels: {[key: string]: string};
}
```

Related Types

```
interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}

interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}

interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {
```

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```
  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
```

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```
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
```

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```
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum InstanceState {
  OFFLINE = "OFFLINE",
  INITIALIZING = "INITIALIZING",
  INITIALIZED = "INITIALIZED",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  FAILED = "FAILED",
}
```

13.7 Create Instance

Create an instance

URI Template

```
POST /api/instances
```

Request Body

```
interface CreateInstanceRequest {

  // **Required.** The name of the instance.
  name: string;

  // **Required.** The name of the template for this instance.
  template: string;

  // Arguments for substitution in the template definition. Each entry is
  // keyed by the argument name. The value must be a string.
  templateArgs: {[key: string]: string};

  // Labels assigned to this instance. Each entry is keyed by the tag name
  // of the label. The value represent the label value for that tag.
  labels: {[key: string]: string};
}
```

Response Type

```
interface YamcsInstance {

  // Instance name.
  name: string;
  missionDatabase: MissionDatabase;
  processors: ProcessorInfo[];
  state: InstanceState;

  //in case the state=FAILED, this field will indicate the cause of the failure
  // the missionDatabase and other fields may not be filled when this happens
  failureCause: string;
  missionTime: string;  // RFC 3339
  labels: {[key: string]: string};
}
```

Related Types

```
interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}

interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}

interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
```

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```
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
```

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```
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {
```

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```
  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum InstanceState {
  OFFLINE = "OFFLINE",
  INITIALIZING = "INITIALIZING",
  INITIALIZED = "INITIALIZED",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  FAILED = "FAILED",
}
```

13.8 Start Instance

Start an instance

If the instance is in the RUNNING state, this call will do nothing. Otherwise the instance will be started.

URI Template

```
POST /api/instances/{instance}:start
```

{instance} Yamcs instance name.

Response Type

```
interface YamcsInstance {

  // Instance name.
  name: string;
  missionDatabase: MissionDatabase;
  processors: ProcessorInfo[];
  state: InstanceState;

  //in case the state=FAILED, this field will indicate the cause of the failure
  // the missionDatabase and other fields may not be filled when this happens
  failureCause: string;
  missionTime: string;  // RFC 3339
  labels: {[key: string]: string};
}
```

Related Types

```
interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}

interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}
```

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```
interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
```

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```
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
```

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```
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum InstanceState {
  OFFLINE = "OFFLINE",
  INITIALIZING = "INITIALIZING",
  INITIALIZED = "INITIALIZED",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  FAILED = "FAILED",
}
```

13.9 Stop Instance

Stop an instance

Stop all services of the instance. The instance state will be OFFLINE. If the instance state is already OFFLINE, this call will do nothing.

URI Template

```
POST /api/instances/{instance}:stop
```

{instance} Yamcs instance name.

Response Type

```
interface YamcsInstance {

  // Instance name.
  name: string;
  missionDatabase: MissionDatabase;
  processors: ProcessorInfo[];
  state: InstanceState;

  //in case the state=FAILED, this field will indicate the cause of the failure
  // the missionDatabase and other fields may not be filled when this happens
  failureCause: string;
  missionTime: string;  // RFC 3339
  labels: {[key: string]: string};
}
```

Related Types

```
interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}

interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}
```

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```
interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
```

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```
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
```

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```
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum InstanceState {
  OFFLINE = "OFFLINE",
  INITIALIZING = "INITIALIZING",
  INITIALIZED = "INITIALIZED",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  FAILED = "FAILED",
}
```

13.10 Restart Instance

Restart an instance

If the instance state is RUNNING, the instance will be stopped and then restarted. Otherwise the instance will be started. Note that the Mission Database will also be reloaded before restart.

URI Template

```
POST /api/instances/{instance}:restart
```

{instance} Yamcs instance name.

Response Type

```
interface YamcsInstance {

  // Instance name.
  name: string;
  missionDatabase: MissionDatabase;
  processors: ProcessorInfo[];
  state: InstanceState;

  //in case the state=FAILED, this field will indicate the cause of the failure
  // the missionDatabase and other fields may not be filled when this happens
  failureCause: string;
  missionTime: string;  // RFC 3339
  labels: {[key: string]: string};
}
```

Related Types

```
interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}

interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}
```

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```
interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
```

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```
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
```

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```
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum InstanceState {
  OFFLINE = "OFFLINE",
  INITIALIZING = "INITIALIZING",
  INITIALIZED = "INITIALIZED",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  FAILED = "FAILED",
}
```

13.11 List Services

List services

URI Template

```
GET /api/services/{instance}
```

{instance} Yamcs instance name. Or _global for system-wide services.

Response Type

```
interface ListServicesResponse {
  services: ServiceInfo[];
}
```

Related Types

```
interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}
```

13.12 Get Service

Get a service

URI Template

```
GET /api/services/{instance}/{name}
```

{instance} Yamcs instance name. Or _global for system-wide services.

{name} Service name

Response Type

```
interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}
```

Related Types

```
enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}
```

13.13 Start Service

Start a service

URI Template

```
POST /api/services/{instance}/{name}:start
```

{instance} Yamcs instance name. Or _global for system-wide services.

{name} Service name

Related Types

13.14 Stop Service

Stop a service

Once stopped, a service cannot be resumed. Instead a new service instance will be created and started.

URI Template

```
POST /api/services/{instance}/{name}:stop
```

{instance} Yamcs instance name. Or _global for system-wide services.

{name} Service name

Related Types

13.15 List Links

List links

URI Template

```
GET /api/links/{instance?}
```

{instance?} Yamcs instance name.

Response Type

```
interface ListLinksResponse {
  links: LinkInfo[];
}
```

Related Types

```
interface LinkInfo {
  instance: string;
  name: string;
  type: string;
  spec: string;
  disabled: boolean;
  status: string;
  dataInCount: string;  // String decimal
  dataOutCount: string;  // String decimal
  detailedStatus: string;

  //if this is a sublink of an aggregated data link, this is the name of the parent
  parentName: string;
}
```

13.16 Get Link

Get a link

URI Template

```
GET /api/links/{instance}/{name}
```

{instance} Yamcs instance name.

{name} Link name.

Response Type

```
interface LinkInfo {
  instance: string;
  name: string;
  type: string;
  spec: string;
  disabled: boolean;
  status: string;
  dataInCount: string;  // String decimal
  dataOutCount: string;  // String decimal
  detailedStatus: string;

  //if this is a sublink of an aggregated data link, this is the name of the parent
  parentName: string;
}
```

Related Types

13.17 Update Link

Update a link

URI Template

```
PATCH /api/links/{instance}/{name}
```

{instance} Yamcs instance name.

{name} Link name.

Request Body

```
interface EditLinkRequest {

  // The state of the link. Either ``enabled`` or ``disabled``.
  state: string;
  resetCounters: boolean;
}
```

Response Type

```
interface LinkInfo {
  instance: string;
  name: string;
  type: string;
  spec: string;
  disabled: boolean;
  status: string;
  dataInCount: string;  // String decimal
  dataOutCount: string;  // String decimal
```

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```
  detailedStatus: string;

  //if this is a sublink of an aggregated data link, this is the name of the parent
  parentName: string;
}
```

Related Types

```

```

13.18 Subscribe Links

Receive link updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `links`.

Input Type

```
interface SubscribeLinksRequest {
  instance: string;
}
```

Output Type

```
interface LinkEvent {
  type: Type;
  linkInfo: LinkInfo;
}
```

Related Types

```
interface LinkInfo {
  instance: string;
  name: string;
  type: string;
  spec: string;
  disabled: boolean;
  status: string;
  dataInCount: string;  // String decimal
  dataOutCount: string;  // String decimal
  detailedStatus: string;

  //if this is a sublink of an aggregated data link, this is the name of the parent
  parentName: string;
}
```

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```
enum Type {

  // A new link was registered. You also receive this event directly after you␣
↪subscribe,
  //  for every link that is registered at that time.
  REGISTERED = "REGISTERED",

  // A link was unregistered.
  UNREGISTERED = "UNREGISTERED",

  // A link was updated in one of its attributes, for example the dataCount has␣
↪increased,
  // or the status has changed.
  UPDATED = "UPDATED",
}
```

CHAPTER

FOURTEEN

MDB

14.1 Get Mission Database

Get a mission database

URI Template

```
GET /api/mdb/{instance}
```

{instance} Yamcs instance name.

Response Type

```
interface MissionDatabase {

  // This is the config section in mdb.yaml
  configName: string;

  // Root space-system name
  name: string;

  // Root space-system header version
  version: string;
  spaceSystem: SpaceSystemInfo[];
  parameterCount: number;
  containerCount: number;
  commandCount: number;
  algorithmCount: number;
  parameterTypeCount: number;
}
```

Related Types

```
interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}
```

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```
interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}
```

14.2 Export Java Mission Database

Export a java serialized dump of the mission database

URI Template

```
GET /api/mdb/{instance}:exportJava
```

{instance} Yamcs instance name.

Related Types

14.3 List Space Systems

List space systems

URI Template

```
GET /api/mdb/{instance}/space-systems
```

{instance}

Query Parameters

q

next

pos

limit

Response Type

```
interface ListSpaceSystemsResponse {
  spaceSystems: SpaceSystemInfo[];
  continuationToken: string;
  totalSize: number;
}
```

Related Types

```
interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}

interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}
```

14.4 Get Space System

Get a space system

URI Template

```
GET /api/mdb/{instance}/space-systems/{name*}
```

{instance} Yamcs instance name.

{name*} Space-system name.

Response Type

```
interface SpaceSystemInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  version: string;
  history: HistoryInfo[];
  sub: SpaceSystemInfo[];
}
```

Related Types

```
interface HistoryInfo {
  version: string;
  date: string;
  message: string;
  author: string;
}
```

14.5 List Parameters

List parameters

URI Template

```
GET /api/mdb/{instance}/parameters
```

{instance} Yamcs instance name.

Query Parameters

q

The search keywords. This supports searching on namespace or name.

details

Include details on each returned parameter (this includes long descriptions, aliases, and detailed type information). If unset, only summary information is returned.

type

The parameter types to be included in the result. Valid types are `boolean`, `binary`, `enumeration`, `float`, `integer` or `string`. If unspecified, parameters of all types will be included.

source

system

List only direct child sub-systems or parameters of the specified system. For example when querying the system "/a" against an MDB with parameters "/a/b/c" and "/a/c", the result returns the sub system "/a/b" and the parameter "/a/c".

When `system` and `q` are used together, matching parameters at any depth are returned, starting from the specified space system.

next

pos

The zero-based row number at which to start outputting results. Default: `0`

limit

The maximum number of returned parameters per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

Response Type

```
interface ListParametersResponse {
  spaceSystems: string[];
  parameters: ParameterInfo[];
  continuationToken: string;
  totalSize: number;
}
```

Related Types

```
interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}
```

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```
interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}
```

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```
interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}
```

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```
interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
```

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```
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
```

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```
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

14.6 Get Parameter

Get a parameter

URI Template

```
GET /api/mdb/{instance}/parameters/{name*}
```

{instance}

{name*}

Response Type

```
interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
```

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```
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
```

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```
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;
```

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```
  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
```

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```
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

14.7 Batch Get Parameters

Batch get of multiple parameters

URI Template

```
POST /api/mdb/{instance}/parameters:batchGet
```

{instance}

Request Body

```
interface BatchGetParametersRequest {
  id: NamedObjectId[];
}
```

Response Type

```
interface BatchGetParametersResponse {
  response: GetParameterResponse[];
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface GetParameterResponse {
  id: NamedObjectId;
  parameter: ParameterInfo;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
```

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```
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}
```

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```
interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}
```

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```
interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;
```

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```
  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

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```
enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

14.8 List Containers

List containers

URI Template

```
GET /api/mdb/{instance}/containers
```

{instance} Yamcs instance name.

Query Parameters

q

The search keywords. This supports searching on the namespace or name.

system

List only direct child sub-systems or containers of the specified system. For example when querying the system "/a" against an MDB with containers "/a/b/c" and "/a/c", the result returns the sub system "/a/b" and the container "/a/c".

When `system` and `q` are used together, matching containers at any depth are returned, starting from the specified space system.

next

pos

The zero-based row number at which to start outputting results. Default: `0`

limit

The maximum number of returned containers per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

Response Type

```
interface ListContainersResponse {
  spaceSystems: string[];
  containers: ContainerInfo[];
  continuationToken: string;
  totalSize: number;
}
```

Related Types

```
interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
```

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```
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface UnitInfo {
  unit: string;
```

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```
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
```

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```
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
```

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```
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}
```

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```
enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

14.9 Get Container

Get a container

URI Template

```
GET /api/mdb/{instance}/containers/{name*}
```

{instance}

{name*}

Response Type

```
interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
```

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```
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
```

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```
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
```

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```
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
```

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```
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

14.10 List Commands

List commands

URI Template

```
GET /api/mdb/{instance}/commands
```

{instance} Yamcs instance name.

Query Parameters

q

The search keywords. This supports searching on namespace or name.

system

List only direct child sub-systems or commands of the specified system. For example when querying the system "/a" against an MDB with commands "/a/b/c" and "/a/c", the result returns the sub system "/a/b" and the command "/a/c".

When `system` and `q` are used together, matching commands at any depth are returned, starting from the specified space system.

details

next

pos

The zero-based row number at which to start outputting results. Default: `0`

limit

The maximum number of returned commands per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

noAbstract

Exclude abstract commands

Response Type

```
interface ListCommandsResponse {
  spaceSystems: string[];
  commands: CommandInfo[];
  continuationToken: string;
  totalSize: number;
}
```

Related Types

```
interface CommandInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  baseCommand: CommandInfo;
  abstract: boolean;
  argument: ArgumentInfo[];
  argumentAssignment: ArgumentAssignmentInfo[];
  significance: SignificanceInfo;
  constraint: TransmissionConstraintInfo[];
```

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```
  commandContainer: CommandContainerInfo;
  verifier: VerifierInfo[];
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}
```

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```
interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
```

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```
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
```

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```
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface ArgumentAssignmentInfo {
  name: string;
```

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```
  value: string;
}

interface SignificanceInfo {
  consequenceLevel: SignificanceLevelType;
  reasonForWarning: string;
}

interface TransmissionConstraintInfo {
  comparison: ComparisonInfo[];
  timeout: string;  // String decimal
}

interface CommandContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  sizeInBits: number;
  baseContainer: CommandContainerInfo;
  entry: SequenceEntryInfo[];
}

interface VerifierInfo {
  stage: string;
  container: ContainerInfo;
  algorithm: AlgorithmInfo;
  onSuccess: TerminationActionType;
  onFail: TerminationActionType;
  onTimeout: TerminationActionType;
  checkWindow: CheckWindowInfo;
}

interface CheckWindowInfo {
  timeToStartChecking: string;  // String decimal
  timeToStopChecking: string;  // String decimal
  relativeTo: string;
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
```

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```
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum TerminationActionType {
  SUCCESS = "SUCCESS",
  FAIL = "FAIL",
}
```

14.11 Get Command

Get a command

URI Template

```
GET /api/mdb/{instance}/commands/{name*}
```

{instance}

{name*}

Response Type

```
interface CommandInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  baseCommand: CommandInfo;
  abstract: boolean;
  argument: ArgumentInfo[];
  argumentAssignment: ArgumentAssignmentInfo[];
  significance: SignificanceInfo;
  constraint: TransmissionConstraintInfo[];
  commandContainer: CommandContainerInfo;
  verifier: VerifierInfo[];
  ancillaryData: {[key: string]: AncillaryDataInfo};
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
```

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```
  rangeMin: number;
  rangeMax: number;
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
```

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```
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
```

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```
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
```

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```
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface ArgumentAssignmentInfo {
  name: string;
  value: string;
}

interface SignificanceInfo {
  consequenceLevel: SignificanceLevelType;
  reasonForWarning: string;
}

interface TransmissionConstraintInfo {
  comparison: ComparisonInfo[];
  timeout: string;  // String decimal
}

interface CommandContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  sizeInBits: number;
  baseContainer: CommandContainerInfo;
  entry: SequenceEntryInfo[];
}

interface VerifierInfo {
  stage: string;
  container: ContainerInfo;
  algorithm: AlgorithmInfo;
  onSuccess: TerminationActionType;
```

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```
  onFail: TerminationActionType;
  onTimeout: TerminationActionType;
  checkWindow: CheckWindowInfo;
}

interface CheckWindowInfo {
  timeToStartChecking: string;  // String decimal
  timeToStopChecking: string;  // String decimal
  relativeTo: string;
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
```

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```
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum TerminationActionType {
  SUCCESS = "SUCCESS",
  FAIL = "FAIL",
}
```

14.12 List Algorithms

List algorithms

URI Template

```
GET /api/mdb/{instance}/algorithms
```

{instance}

Query Parameters

q

system

next

pos

limit

Response Type

```
interface ListAlgorithmsResponse {
  spaceSystems: string[];
  algorithms: AlgorithmInfo[];
  continuationToken: string;
  totalSize: number;
}
```

Related Types

```
interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
```

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```
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
```

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```
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}
```

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```
interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}
```

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```
interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
```

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```
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

14.13 Get Algorithm

Get an algorithm

URI Template

```
GET /api/mdb/{instance}/algorithms/{name*}
```

{instance} Yamcs instance name.

{name*} Algorithm name.

Response Type

```
interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
```

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```
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
```

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```
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
```

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```
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}
```

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```
interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
```

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```
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

14.14 Update Parameter

Update a parameter's definition

URI Template

```
PATCH /api/mdb/{instance}/{processor}/parameters/{name*}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name*} Alarm name.

Request Body

```
// Used to change calibrators or alarms for one parameter
interface UpdateParameterRequest {

  // The action by which to modify this alarm.
  action: ActionType;

  // Used when action = SET_DEFAULT_CALIBRATOR or SET_CALIBRATORS
  defaultCalibrator: CalibratorInfo;
```

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```
  // Used when action = SET_CALIBRATORS
  contextCalibrator: ContextCalibratorInfo[];

  // Used when action = SET_DEFAULT_ALARMS or SET_ALARMS
  defaultAlarm: AlarmInfo;

  // Used when action = SET_ALARMS
  contextAlarm: ContextAlarmInfo[];
}
```

Response Type

```
interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}
```

Related Types

```
interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
```

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```
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
```

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```
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface UnitInfo {
```

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```
  unit: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
```

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```
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

enum ActionType {

  // Reset all parameter properties (calibrators+alarms) to their default
  // Mission Database value
  RESET = "RESET",

  // Reset calibrators to their default MDB value
  RESET_CALIBRATORS = "RESET_CALIBRATORS",

  // Sets the default calibrator (the contextual ones are unmodified)
  SET_DEFAULT_CALIBRATOR = "SET_DEFAULT_CALIBRATOR",

  // Sets all calibrations (default + contextual), if default is not set,
  // the existing calibration is not modified
  SET_CALIBRATORS = "SET_CALIBRATORS",

  // Reset alarms to their default Mission Database value
  RESET_ALARMS = "RESET_ALARMS",

  // Sets the default alarms (contextual ones are unmodified)
  SET_DEFAULT_ALARMS = "SET_DEFAULT_ALARMS",

  // Sets all alarms (default + contextual), if default is not set, the
  // existing alarm is not modified.
  SET_ALARMS = "SET_ALARMS",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
```

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```
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

14.15 Update Algorithm

Update an algorithm's definition

URI Template

```
PATCH /api/mdb/{instance}/{processor}/algorithms/{name*}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name*} Algorithm name.

Request Body

```
interface UpdateAlgorithmRequest {

  // The action by which to modify this algorithm
  action: ActionType;

  // Used when action = SET
  algorithm: AlgorithmInfo;
}
```

Related Types

```
interface AlgorithmInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  scope: Scope;
  language: string;
  text: string;
  inputParameter: InputParameterInfo[];
  outputParameter: OutputParameterInfo[];
  onParameterUpdate: ParameterInfo[];
  onPeriodicRate: string[];  // String decimal
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface InputParameterInfo {
  parameter: ParameterInfo;
  inputName: string;
  parameterInstance: number;
  mandatory: boolean;
}

interface ParameterInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
```

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```
  type: ParameterTypeInfo;
  dataSource: DataSourceType;
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface ParameterTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  defaultAlarm: AlarmInfo;
  enumValue: EnumValue[];
  absoluteTimeInfo: AbsoluteTimeInfo;
  contextAlarm: ContextAlarmInfo[];
  member: MemberInfo[];
  arrayInfo: ArrayInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface DataEncodingInfo {
  type: Type;
  littleEndian: boolean;
  sizeInBits: number;
  encoding: string;
  defaultCalibrator: CalibratorInfo;
  contextCalibrator: ContextCalibratorInfo[];
}

interface CalibratorInfo {
  polynomialCalibrator: PolynomialCalibratorInfo;
  splineCalibrator: SplineCalibratorInfo;
  javaExpressionCalibrator: JavaExpressionCalibratorInfo;
  type: Type;
}

interface PolynomialCalibratorInfo {
  coefficient: number[];
}

interface SplineCalibratorInfo {
  point: SplinePointInfo[];
}

interface SplinePointInfo {
  raw: number;
  calibrated: number;
}

interface JavaExpressionCalibratorInfo {
  formula: string;
}

interface ContextCalibratorInfo {
  comparison: ComparisonInfo[];
  calibrator: CalibratorInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
```

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```
}

interface ComparisonInfo {
  parameter: ParameterInfo;
  operator: OperatorType;
  value: string;
}

interface UnitInfo {
  unit: string;
}

interface AlarmInfo {
  minViolations: number;
  staticAlarmRange: AlarmRange[];
  enumerationAlarm: EnumerationAlarm[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

interface EnumerationAlarm {
  level: AlarmLevelType;
  label: string;
}

interface EnumValue {
  value: string;  // String decimal
  label: string;
}

interface AbsoluteTimeInfo {
  initialValue: string;
  scale: number;
  offset: number;
  offsetFrom: ParameterInfo;
  epoch: string;
}

interface ContextAlarmInfo {
  comparison: ComparisonInfo[];
  alarm: AlarmInfo;

  // This can be used in UpdateParameterRequest to pass a context
  // that is parsed on the server, according to the rules in the
  // excel spreadsheet. Either this or a comparison has to be
  // used (not both at the same time)
  context: string;
}

interface MemberInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
```

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```
  type: ParameterTypeInfo;
}

interface ArrayInfo {
  type: ParameterTypeInfo;
  dimensions: number;
}

interface UsedByInfo {
  algorithm: AlgorithmInfo[];
  container: ContainerInfo[];
}

interface ContainerInfo {
  name: string;
  qualifiedName: string;
  shortDescription: string;
  longDescription: string;
  alias: NamedObjectId[];
  maxInterval: string;  // String decimal
  sizeInBits: number;
  baseContainer: ContainerInfo;
  restrictionCriteria: ComparisonInfo[];
  entry: SequenceEntryInfo[];
  usedBy: UsedByInfo;
  ancillaryData: {[key: string]: AncillaryDataInfo};
}

interface SequenceEntryInfo {
  locationInBits: number;
  referenceLocation: ReferenceLocationType;

  // For use in sequence containers
  container: ContainerInfo;
  parameter: ParameterInfo;

  // For use in command containers
  argument: ArgumentInfo;
  fixedValue: FixedValueInfo;
  repeat: RepeatInfo;
}

interface ArgumentInfo {
  name: string;
  description: string;

  //optional string type = 3;
  initialValue: string;

  // repeated UnitInfo unitSet = 5;
  type: ArgumentTypeInfo;
}

interface ArgumentTypeInfo {
  engType: string;
  dataEncoding: DataEncodingInfo;
  unitSet: UnitInfo[];
  enumValue: EnumValue[];
  rangeMin: number;
  rangeMax: number;
}
```

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```
interface FixedValueInfo {
  name: string;
  hexValue: string;
  sizeInBits: number;
}

interface RepeatInfo {
  fixedCount: string;  // String decimal
  dynamicCount: ParameterInfo;
  bitsBetween: number;
}

interface OutputParameterInfo {
  parameter: ParameterInfo;
  outputName: string;
}

enum ActionType {

  // Restores the original MDB definition
  RESET = "RESET",

  // Sets the algorithm text
  SET = "SET",
}

enum Scope {
  GLOBAL = "GLOBAL",
  COMMAND_VERIFICATION = "COMMAND_VERIFICATION",
  CONTAINER_PROCESSING = "CONTAINER_PROCESSING",
}

enum Type {
  BINARY = "BINARY",
  BOOLEAN = "BOOLEAN",
  FLOAT = "FLOAT",
  INTEGER = "INTEGER",
  STRING = "STRING",
}

enum Type {
  POLYNOMIAL = "POLYNOMIAL",
  SPLINE = "SPLINE",
  MATH_OPERATION = "MATH_OPERATION",
  JAVA_EXPRESSION = "JAVA_EXPRESSION",
}

enum OperatorType {
  EQUAL_TO = "EQUAL_TO",
  NOT_EQUAL_TO = "NOT_EQUAL_TO",
  GREATER_THAN = "GREATER_THAN",
  GREATER_THAN_OR_EQUAL_TO = "GREATER_THAN_OR_EQUAL_TO",
  SMALLER_THAN = "SMALLER_THAN",
  SMALLER_THAN_OR_EQUAL_TO = "SMALLER_THAN_OR_EQUAL_TO",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
```

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```
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum DataSourceType {
  TELEMETERED = "TELEMETERED",
  DERIVED = "DERIVED",
  CONSTANT = "CONSTANT",
  LOCAL = "LOCAL",
  SYSTEM = "SYSTEM",
  COMMAND = "COMMAND",
  COMMAND_HISTORY = "COMMAND_HISTORY",
  EXTERNAL1 = "EXTERNAL1",
  EXTERNAL2 = "EXTERNAL2",
  EXTERNAL3 = "EXTERNAL3",
}

enum ReferenceLocationType {
  CONTAINER_START = "CONTAINER_START",
  PREVIOUS_ENTRY = "PREVIOUS_ENTRY",
}
```

CHAPTER

FIFTEEN

PACKETS

15.1 List Packet Names

List packet names

URI Template

```
GET /api/archive/{instance}/packet-names
```

{instance} Yamcs instance name.

Response Type

```
interface ListPacketNamesResponse {

  // Packet name.
  name: string[];
}
```

Related Types

15.2 List Packets

List packets

URI Template

```
GET /api/archive/{instance}/packets
```

{instance} Yamcs instance name.

Query Parameters

pos

The zero-based row number at which to start outputting results. Default: `0`

limit

The maximum number of returned records per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

order

The order of the returned results. Can be either `asc` or `desc`. Default: `desc`

name

The archived name of the packets. Names must match exactly.

next

start

Filter the lower bound of the packet's generation time. Specify a date string in ISO 8601 format. This bound is inclusive.

stop

Filter the upper bound of the packet's generation time. Specify a date string in ISO 8601 format. This bound is exclusive.

Response Type

```
interface ListPacketsResponse {
  packet: TmPacketData[];
  continuationToken: string;
}
```

Related Types

```
interface TmPacketData {
  packet: string;  // Base64
  sequenceNumber: number;
  id: NamedObjectId;
  receptionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

15.3 Get Packet

Get a packet

URI Template

```
GET /api/archive/{instance}/packets/{gentime}/{seqnum}
```

{instance} Yamcs instance name.

{gentime} an exact match of the packet's generation time in ISO 8601 format. Example: 2015-10-20T06:47:02.000

{seqnum} Yamcs-specific archive distinguisher

Response Type

```
interface TmPacketData {
  packet: string;  // Base64
  sequenceNumber: number;
  id: NamedObjectId;
  receptionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

15.4 Stream Packets

Streams back packets

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/stream-archive/{instance}:streamPackets
```

{instance} Yamcs instance name.

Request Body

```
interface StreamPacketsRequest {
  start: string;  // RFC 3339
  stop: string;  // RFC 3339
  name: string[];
}
```

Response Type

```
interface TmPacketData {
  packet: string;  // Base64
  sequenceNumber: number;
  id: NamedObjectId;
  receptionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

15.5 Export Packets

Export raw packets

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
GET /api/archive/{instance}:exportPackets
```

{instance} Yamcs instance name.

Query Parameters

start

Filter the lower bound of the packet's generation time. Specify a date string in ISO 8601 format. This bound is inclusive.

stop

Filter the upper bound of the packet's generation time. Specify a date string in ISO 8601 format. This bound is exclusive.

name

The archived name of the packets. Names must match exactly.

Related Types

15.6 Subscribe Packets

Subscribe to packets

This subscription is performed at stream level. It is not currently possible to subscribe to the telemetry of a processor (but most of the time the telemetry in a processor is coming from a stream).

Because messages are received from a stream, NamedObjectId (which is the identifier of the packet) is not filled in.

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `packets`.

Input Type

```
interface SubscribePacketsRequest {

  // Yamcs instance name.
  instance: string;

  // Stream name.
  stream: string;
}
```

Output Type

```
interface TmPacketData {
  packet: string;  // Base64
  sequenceNumber: number;
  id: NamedObjectId;
  receptionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}
```

CHAPTER

SIXTEEN

PARAMETER ARCHIVE

16.1 Rebuild Range

Rebuild range

The back filler has to be enabled for this purpose. The back filling process does not remove data but just overwrites it. That means that if the parameter replay returns less parameters than originally stored in the archive, the old parameters will still be found in the archive.

It also means that if a replay returns the parameter of a different type than originally stored, the old ones will still be stored. This is because the parameter archive treats parameter with the same name but different type as different parameters. Each of them is given an id and the id is stored in the archive.

URI Template

```
POST /api/archive/{instance}/parameterArchive:rebuild
```

{instance} Yamcs instance name.

Request Body

```
// Note that the archive is built in segments of approximatively 70 minutes,␣
↪therefore the
// real start will be before the specified start and the real stop will be after␣
↪the
// specified stop.
interface RebuildRangeRequest {

  // Start rebuilding from here. Specify a date string in ISO 8601 format.
  start: string;  // RFC 3339

  // Rebuild until here. Specify a date string in ISO 8601 format.
  stop: string;  // RFC 3339
}
```

Related Types

16.2 Delete Partitions

Delete partitions

Response is of type string and list the partitions that have been removed.

URI Template

```
POST /api/archive/{instance}/parameterArchive:deletePartitions
```

{instance} Yamcs instance name.

Request Body

```
interface DeletePartitionsRequest {

  // Start with the partition that contains this timestamp. Specify a date string
↪in ISO 8601 format.
  start: string;  // RFC 3339

  // Stop with the partition that contains this timestamp. The stop partition will
↪be removed as
  // well. Specify a date string in ISO 8601 format.
  stop: string;  // RFC 3339
}
```

Response Type

```
interface StringMessage {
  message: string;
}
```

Related Types

16.3 Get Archived Parameter Info

Get parameter info

URI Template

```
GET /api/archive/{instance}/parameterArchive/info/parameter/{name*}
```

{instance}

{name*}

Response Type

```
interface StringMessage {
  message: string;
}
```

Related Types

16.4 Get Parameter Samples

Get parameter samples

This divides the query interval in a number of intervals and returns aggregated statistics (max,min,avg) about each interval.

This operation is useful when making high-level overviews (such as plots) of a parameter's value over large time intervals without having to retrieve each and every individual parameter value.

By default this operation fetches data from the parameter archive and/or parameter cache. If these services are not configured, you can still get correct results by specifying the option `source=replay` as detailed below.

URI Template

```
GET /api/archive/{instance}/parameters/{name*}/samples
```

{instance} Yamcs instance name.

{name*} Parameter name.

Query Parameters

start

Filter the lower bound of the parameter's generation time. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the parameter's generation time. Specify a date string in ISO 8601 format.

count

Number of intervals to use. Default: `500`.

norealtime

Disable loading of parameters from the parameter cache. Default: `false`.

processor

The name of the processor from which to use the parameter cache. Default: `realtime`.

source

Specifies how to retrieve the parameters. Either `ParameterArchive` or `replay`. If `replay` is specified, a replay processor will be created and data will be processed with the active Mission Database. Note that this is much slower than receiving data from the ParameterArchive.

Default: `ParameterArchive`.

Response Type

```
interface TimeSeries {
  sample: Sample[];
}
```

Related Types

```
interface Sample {
  time: string;
  avg: number;
  min: number;
  max: number;
  n: number;
}
```

16.5 Get Parameter Ranges

Get parameter ranges

A range is a tuple `(start, stop, value, count)` that represents the time interval for which the parameter has been steadily coming in with the same value. This request is useful for retrieving an overview for parameters that change unfrequently in a large time interval. For example an on/off status of a device, or some operational status. Two consecutive ranges containing the same value will be returned if there was a gap in the data. The gap is determined according to the parameter expiration time configured in the Mission Database.

URI Template

```
GET /api/archive/{instance}/parameters/{name*}/ranges
```

{instance} Yamcs instance name.

{name*} Parameter name.

Query Parameters

start

Filter the lower bound of the parameter's generation time. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the parameter's generation time. Specify a date string in ISO 8601 format.

minGap

Time in milliseconds. Any gap (detected based on parameter expiration) smaller than this will be ignored. However if the parameter changes value, the ranges will still be split.

maxGap

Time in milliseconds. If the distance between two subsequent values of the parameter is bigger than this value (but smaller than the parameter expiration), then an artificial gap will be constructed. This also applies if there is no parameter expiration defined for the parameter.

norealtime

Disable loading of parameters from the parameter cache. Default: `false`.

processor

The name of the processor from which to use the parameter cache. Default: `realtime`.

source

Response Type

```
interface Ranges {
  range: Range[];
}
```

Related Types

```
interface Range {

  // Generation time of a parameter value.
  timeStart: string;

  // If the value changes, ``timeStop`` is the generation time of the new value.
  // If the parameter expires or the ``maxGap`` has been set, ``timeStop`` is
  // the generation time of the last value plus the expiration time or the
  // ``maxGap``.
  timeStop: string;

  // the engineering value of the parameter in the interval ``[timeStart,␣
↪timeStop)``
  // Time intervals have to be considered as closed at start and open at stop.
  engValue: Value;

  // Number of parameter values received in the interval.
  count: number;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
```

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```
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

16.6 List Parameter History

List parameter history

URI Template

```
GET /api/archive/{instance}/parameters/{name*}
```

{instance} Yamcs instance name.

{name*} Parameter name.

Query Parameters

pos

The zero-based row number at which to start outputting results. Default: `0`.

limit

The maximum number of returned records per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`.

norepeat

Whether to filter out consecutive identical values. Default `no`.

start

Filter the lower bound of the parameter's generation time. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the parameter's generation time. Specify a date string in ISO 8601 format.

order

The order of the returned results. Can be either `asc` or `desc`. Default: `desc`.

norealtime

Disable loading of parameters from the parameter cache. Default: `false`.

processor

The name of the processor from which to use the parameter cache. Default: `realtime`.

source

Specifies how to retrieve the parameters. Either `ParameterArchive` or `replay`. If `replay` is specified, a replay processor will be created and data will be processed with the active Mission Database. Note that this is much slower than receiving data from the ParameterArchive.

Default: `ParameterArchive`.

next

Response Type

```
interface ListParameterHistoryResponse {
  parameter: ParameterValue[];
  continuationToken: string;
}
```

Related Types

```
interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
```

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```
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

enum Type {
  FLOAT = "FLOAT",
```

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```
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

CHAPTER

SEVENTEEN

PROCESSING

17.1 List Processor Types

List processor types

URI Template

```
GET /api/processor-types
```

Response Type

```
interface ListProcessorTypesResponse {
  types: string[];
}
```

Related Types

17.2 List Processors

List processors

URI Template

```
GET /api/processors
```

Query Parameters

instance

Return only processors of this instance

Response Type

```
interface ListProcessorsResponse {
  processors: ProcessorInfo[];
}
```

Related Types

```
interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}

//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
```

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```
  type: ReplaySpeedType;
  param: number;
}

interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}
```

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```
enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
  STOP = "STOP",
}

enum ReplaySpeedType {
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}
```

17.3 Get Processor

Get a processor

URI Template

```
GET /api/processors/{instance}/{processor}
```

{instance} Yamcs instance name.

{processor} Processor name.

Response Type

```
interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}
```

Related Types

```
//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}
```

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```
interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
```

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```
  STOP = "STOP",
}

enum ReplaySpeedType {
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}
```

17.4 Delete Processor

Delete a processor

Only replay processors can be removed.

URI Template

```
DELETE /api/processors/{instance}/{processor}
```

{instance} Yamcs instance name.

{processor} Processor name.

Related Types

17.5 Edit Processor

Update a processor

URI Template

```
PATCH /api/processors/{instance}/{processor}
```

{instance} Yamcs instance name.

{processor} Processor name.

Request Body

```
interface EditProcessorRequest {

  // The state this replay processor should be updated to. Either ``paused`` or
  // ``running``.
  state: string;

  // The time where the processing needs to jump towards. Must be a date string
  // in ISO 8601 format.
  seek: string;  // RFC 3339

  // The speed of the processor. One of:
  // * ``afap``
  // * a speed factor relative to the original speed. Example: ``2x``
  // * a fixed delay value in milliseconds. Example: ``2000``
  speed: string;
}
```

Related Types

17.6 Create Processor

Create a processor

URI Template

```
POST /api/processors
```

Request Body

```
interface CreateProcessorRequest {

  // **Required.** The name of the Yamcs instance.
  instance: string;

  // **Required.** The name of the processor. Must be unique for the Yamcs
↪instance.
  name: string;

  // The client IDs that should be connected to this processor.
  clientId: number[];

  // Keep the processor when terminated. Default: ``no``.
  persistent: boolean;

  // **Required.** The type of the processor. The available values depend on how
  // Yamcs Server is configured. Most Yamcs deployments support at least a type
  // ``Archive`` which allows for the creation of processors replaying archived
  // data.
  type: string;

  // Configuration options specific to the processor type. Note that this should
  // be a string representation of a valid JSON structure.
  config: string;
}
```

Related Types

17.7 Get Parameter Value

Get a parameter's value

URI Template

```
GET /api/processors/{instance}/{processor}/parameters/{name*}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name*} Parameter name.

Query Parameters

fromCache

Whether the latest cached value may be returned. Default: `yes`.

timeout

Time in milliseconds to wait on a value (only considered if `fromCache=no`). When the timeout is met, the call will return with no or partial data. Default: `10000`.

Response Type

```
interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
```

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```
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}
```

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```
enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

17.8 Set Parameter Value

Set a parameter's value

Only some type of parameters can be updated.

URI Template

```
PUT /api/processors/{instance}/{processor}/parameters/{name*}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name*} Parameter name.

Request Body

```
// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
```

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```
  arrayValue: Value[];
}
```

Related Types

```
// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

17.9 Batch Get Parameter Values

Batch get the value of multiple parameters

URI Template

```
POST /api/processors/{instance}/{processor}/parameters:batchGet
```

{instance} Yamcs instance name.

{processor} Processor name.

Request Body

```
interface BatchGetParameterValuesRequest {
  id: NamedObjectId[];
  fromCache: boolean;

  // if not fromCache, wait this time (in milliseconds) to receive the parameter
  timeout: string;  // String decimal
}
```

Response Type

```
interface BatchGetParameterValuesResponse {
  value: ParameterValue[];
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}

// Union type for storing a value
interface Value {
```

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```
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",
```

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```
  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

17.10 Batch Set Parameter Values

Batch set the value of multiple parameters

URI Template

```
POST /api/processors/{instance}/{processor}/parameters:batchSet
```

{instance} Yamcs instance name.

{processor} Processor name.

Request Body

```
interface BatchSetParameterValuesRequest {
  request: SetParameterValueRequest[];
}
```

Related Types

```
interface SetParameterValueRequest {
  id: NamedObjectId;
  value: Value;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

17.11 Subscribe TM Statistics

Receive TM statistics updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `tmstats`.

Input Type

```
interface SubscribeTMStatisticsRequest {
  instance: string;
  processor: string;
}
```

Output Type

```
interface Statistics {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  processor: string;
  tmstats: TmStatistics[];
  lastUpdated: string;  // RFC 3339
}
```

Related Types

```
interface TmStatistics {

  // Packet name.
  packetName: string;
  qualifiedName: string;
  receivedPackets: string;  // String decimal
  subscribedParameterCount: number;
  lastReceived: string;  // RFC 3339
  lastPacketTime: string;  // RFC 3339
  packetRate: string;  // String decimal
  dataRate: string;  // String decimal
}
```

17.12 Subscribe Parameters

Receive parameter updates

The input message can be sent multiple types, allowing to alter a subscription with the `action` field.

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `parameters`.

This method supports client-streaming. The reply on the first message includes the call identifier assigned by Yamcs. Ensure to specify this call identifier on subsequent messages, or Yamcs will assume that you are making a new unrelated call.

Input Type

```
interface SubscribeParametersRequest {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  processor: string;
  id: NamedObjectId[];

  // Send an error message if any parameter is invalid.
  // Default: true
  abortOnInvalid: boolean;

  // Send parameter updates when parameters expire.
  // The update will have the same value and timestamp like
  // the preceding update, but with acquisition status set to
  // EXPIRED (instead of ACQUIRED)
  // Default: false
  updateOnExpiration: boolean;

  // If available, send immediately the last cached value
  // of each subscribed parameter.
  // Default: true
  sendFromCache: boolean;

  // How to interpret the submitted parameter ids. Default
  // is to replace an exising subscription with the newly
  // submitted list.
  action: Action;
}
```

Output Type

```
interface SubscribeParametersData {

  // mapping between numeric and subscribed id
  mapping: {[key: number]: NamedObjectId};
  invalid: NamedObjectId[];
  values: ParameterValue[];
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
```

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```
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

enum Action {
  REPLACE = "REPLACE",
  ADD = "ADD",
  REMOVE = "REMOVE",
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
```

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```
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

17.13 Subscribe Processors

Receive processor updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `processors`.

Input Type

```
interface SubscribeProcessorsRequest {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  processor: string;
}
```

Output Type

```
interface ProcessorInfo {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  name: string;
  type: string;
  spec: string;
  creator: string;
  hasAlarms: boolean;
  hasCommanding: boolean;
  state: ServiceState;
  replayRequest: ReplayRequest;
  replayState: ReplayState;
  services: ServiceInfo[];
  persistent: boolean;
  time: string;  // RFC 3339
  replay: boolean;
  checkCommandClearance: boolean;
}
```

Related Types

```
//used to replay (concurrently) TM packets, parameters and events
interface ReplayRequest {

  // **Required.** The time at which the replay should start.
  start: string;  // RFC 3339

  // The time at which the replay should stop.
  // If unspecified, the replay will keep going as long  as there is remaining␣
↪data.
  stop: string;  // RFC 3339

  //what should happen at the end of the replay
  endAction: EndAction;

  //how fast the replay should go
  speed: ReplaySpeed;

  // Reverse the direction of the replay
  reverse: boolean;
  parameterRequest: ParameterReplayRequest;

  // By default all Packets, Events, CommandHistory are part of the replay
  // Unless one or more of the below requests are specified.
  packetRequest: PacketReplayRequest;
  eventRequest: EventReplayRequest;
  commandHistoryRequest: CommandHistoryReplayRequest;
  ppRequest: PpReplayRequest;
}

interface ReplaySpeed {
  type: ReplaySpeedType;
  param: number;
}
```

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```
interface ParameterReplayRequest {
  nameFilter: NamedObjectId[];
  sendRaw: boolean;
  performMonitoring: boolean;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface PacketReplayRequest {

  // No filter, means all packets for which privileges exist, are sent
  nameFilter: NamedObjectId[];
}

interface EventReplayRequest {
}

interface CommandHistoryReplayRequest {

  // No filter, means all command history entries are sent
  nameFilter: NamedObjectId[];
}

//Request to replay parameters - they can be filtered by the parameter group
interface PpReplayRequest {

  // No filter, means all pp groups are sent
  groupNameFilter: string[];

  // exclude the parameters from these groups
  //   this takes precedence over the filter above (i.e. if a group is part of␣
↪both, it will be excluded)
  groupNameExclude: string[];
}

interface ServiceInfo {
  instance: string;
  name: string;
  state: ServiceState;
  className: string;
  processor: string;
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}

enum EndAction {
  LOOP = "LOOP",
  QUIT = "QUIT",
```

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```
  STOP = "STOP",
}

enum ReplaySpeedType {
  AFAP = "AFAP",
  FIXED_DELAY = "FIXED_DELAY",
  REALTIME = "REALTIME",
  STEP_BY_STEP = "STEP_BY_STEP",
}

enum ReplayState {

  // just at the beginning or when the replay request (start, stop or packet␣
↪selection) changes
  INITIALIZATION = "INITIALIZATION",
  RUNNING = "RUNNING",

  // The replay has reached the end with the endaction stop
  STOPPED = "STOPPED",

  // The replay stopped due to an error.
  ERROR = "ERROR",
  PAUSED = "PAUSED",

  // The replay is finished and closed
  CLOSED = "CLOSED",
}

enum ServiceState {
  NEW = "NEW",
  STARTING = "STARTING",
  RUNNING = "RUNNING",
  STOPPING = "STOPPING",
  TERMINATED = "TERMINATED",
  FAILED = "FAILED",
}
```

CHAPTER

EIGHTEEN

QUEUE

18.1 List Queues

List command queues

URI Template

```
GET /api/processors/{instance}/{processor}/queues
```

{instance} Yamcs instance namee.

{processor} Processor name.

Response Type

```
interface ListQueuesResponse {
  queues: CommandQueueInfo[];
}
```

Related Types

```
interface CommandQueueInfo {
  instance: string;
  processorName: string;
  name: string;
  state: QueueState;
  nbSentCommands: number;
  nbRejectedCommands: number;
  stateExpirationTimeS: number;
  entry: CommandQueueEntry[];
  order: number;
  users: string[];
  groups: string[];
  minLevel: SignificanceLevelType;
}

//One entry (command) in the command queue
interface CommandQueueEntry {
  instance: string;
  processorName: string;
  queueName: string;
  id: string;
  origin: string;
  sequenceNumber: number;
```

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```
  commandName: string;
  source: string;
  binary: string;  // Base64
  username: string;
  uuid: string;
  comment: string;
  generationTime: string;  // RFC 3339

  //if this is set to true , it means the command has been accepted for being␣
↪released out of the queue
  //but it is still there because it is pending transmission contraints
  pendingTransmissionConstraints: boolean;
}

enum QueueState {
  BLOCKED = "BLOCKED",
  DISABLED = "DISABLED",
  ENABLED = "ENABLED",
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

18.2 Get Queue

Get a command queue

URI Template

```
GET /api/processors/{instance}/{processor}/queues/{name}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name} Queue name.

Response Type

```
interface CommandQueueInfo {
  instance: string;
  processorName: string;
  name: string;
  state: QueueState;
  nbSentCommands: number;
  nbRejectedCommands: number;
  stateExpirationTimeS: number;
  entry: CommandQueueEntry[];
  order: number;
  users: string[];
```

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```
  groups: string[];
  minLevel: SignificanceLevelType;
}
```

Related Types

```
//One entry (command) in the command queue
interface CommandQueueEntry {
  instance: string;
  processorName: string;
  queueName: string;
  id: string;
  origin: string;
  sequenceNumber: number;
  commandName: string;
  source: string;
  binary: string;  // Base64
  username: string;
  uuid: string;
  comment: string;
  generationTime: string;  // RFC 3339

  //if this is set to true , it means the command has been accepted for being␣
↪released out of the queue
  //but it is still there because it is pending transmission contraints
  pendingTransmissionConstraints: boolean;
}

enum QueueState {
  BLOCKED = "BLOCKED",
  DISABLED = "DISABLED",
  ENABLED = "ENABLED",
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

18.3 Update Queue

Update a command queue

URI Template

```
PATCH /api/processors/{instance}/{processor}/queues/{name}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name} Queue name.

Request Body

```
interface EditQueueRequest {

  // The state of the queue. Either ``enabled``, ``disabled`` or ``blocked``.
  state: string;
}
```

Response Type

```
interface CommandQueueInfo {
  instance: string;
  processorName: string;
  name: string;
  state: QueueState;
  nbSentCommands: number;
  nbRejectedCommands: number;
  stateExpirationTimeS: number;
  entry: CommandQueueEntry[];
  order: number;
  users: string[];
  groups: string[];
  minLevel: SignificanceLevelType;
}
```

Related Types

```
//One entry (command) in the command queue
interface CommandQueueEntry {
  instance: string;
  processorName: string;
  queueName: string;
  id: string;
  origin: string;
  sequenceNumber: number;
  commandName: string;
  source: string;
  binary: string;  // Base64
  username: string;
  uuid: string;
  comment: string;
  generationTime: string;  // RFC 3339
```

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```
  //if this is set to true , it means the command has been accepted for being␣
↪released out of the queue
  //but it is still there because it is pending transmission contraints
  pendingTransmissionConstraints: boolean;
}

enum QueueState {
  BLOCKED = "BLOCKED",
  DISABLED = "DISABLED",
  ENABLED = "ENABLED",
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

18.4 Subscribe Queue Statistics

Receive updates on queue stats

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `queue-stats`.

Input Type

```
interface SubscribeQueueStatisticsRequest {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  processor: string;
}
```

Output Type

```
interface CommandQueueInfo {
  instance: string;
  processorName: string;
  name: string;
  state: QueueState;
  nbSentCommands: number;
  nbRejectedCommands: number;
  stateExpirationTimeS: number;
```

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```
  entry: CommandQueueEntry[];
  order: number;
  users: string[];
  groups: string[];
  minLevel: SignificanceLevelType;
}
```

Related Types

```
//One entry (command) in the command queue
interface CommandQueueEntry {
  instance: string;
  processorName: string;
  queueName: string;
  id: string;
  origin: string;
  sequenceNumber: number;
  commandName: string;
  source: string;
  binary: string;  // Base64
  username: string;
  uuid: string;
  comment: string;
  generationTime: string;  // RFC 3339

  //if this is set to true , it means the command has been accepted for being␣
↪released out of the queue
  //but it is still there because it is pending transmission contraints
  pendingTransmissionConstraints: boolean;
}

enum QueueState {
  BLOCKED = "BLOCKED",
  DISABLED = "DISABLED",
  ENABLED = "ENABLED",
}

enum SignificanceLevelType {
  NONE = "NONE",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

18.5 Subscribe Queue Events

Receive updates on queue events

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `queue-events`.

Input Type

```
interface SubscribeQueueEventsRequest {

  // Yamcs instance name.
  instance: string;

  // Processor name.
  processor: string;
}
```

Output Type

```
interface CommandQueueEvent {
  type: Type;
  data: CommandQueueEntry;
}
```

Related Types

```
//One entry (command) in the command queue
interface CommandQueueEntry {
  instance: string;
  processorName: string;
  queueName: string;
  id: string;
  origin: string;
  sequenceNumber: number;
  commandName: string;
  source: string;
  binary: string;  // Base64
  username: string;
  uuid: string;
  comment: string;
  generationTime: string;  // RFC 3339

  //if this is set to true , it means the command has been accepted for being␣
↪released out of the queue
  //but it is still there because it is pending transmission contraints
  pendingTransmissionConstraints: boolean;
}

enum Type {
  COMMAND_ADDED = "COMMAND_ADDED",
  COMMAND_REJECTED = "COMMAND_REJECTED",
```

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```
  COMMAND_SENT = "COMMAND_SENT",
  COMMAND_UPDATED = "COMMAND_UPDATED",
}
```

18.6 List Queue Entries

List command queue entries

URI Template

```
GET /api/processors/{instance}/{processor}/queues/{name}/entries
```

{instance} Yamcs instance name.

{processor} Processor name.

{name} Queue name.

Response Type

```
interface ListQueueEntriesResponse {
  entries: CommandQueueEntry[];
}
```

Related Types

```
//One entry (command) in the command queue
interface CommandQueueEntry {
  instance: string;
  processorName: string;
  queueName: string;
  id: string;
  origin: string;
  sequenceNumber: number;
  commandName: string;
  source: string;
  binary: string;  // Base64
  username: string;
  uuid: string;
  comment: string;
  generationTime: string;  // RFC 3339

  //if this is set to true , it means the command has been accepted for being␣
↪released out of the queue
  //but it is still there because it is pending transmission contraints
  pendingTransmissionConstraints: boolean;
}
```

18.7 Update Queue Entry

Update a command queue entry

URI Template

```
PATCH /api/processors/{instance}/{processor}/queues/{name}/entries/{uuid}
```

{instance} Yamcs instance name.

{processor} Processor name.

{name} Queue name.

{uuid}

Request Body

```
interface EditQueueEntryRequest {

  // The state of the entry. Either ``released`` or ``rejected``.
  state: string;
}
```

Related Types

CHAPTER

NINETEEN

ROCKS DB

19.1 List Tablespaces

List tablespaces

URI Template

```
GET /api/archive/rocksdb/tablespaces
```

Response Type

```
interface ListRocksDbTablespacesResponse {
  tablespaces: RocksDbTablespaceInfo[];
}
```

Related Types

```
interface RocksDbTablespaceInfo {
  name: string;
  dataDir: string;
  databases: RocksDbDatabaseInfo[];
}

interface RocksDbDatabaseInfo {
  tablespace: string;
  dataDir: string;
  dbPath: string;
}
```

19.2 Backup Database

Backup database

URI Template

```
POST /api/archive/rocksdb/{tablespace}/{dbpath*}:backup
```

{tablespace}

{dbpath*}

Related Types

19.3 List Databases

List databases

URI Template

```
GET /api/archive/rocksdb/databases
```

Response Type

```
interface ListRocksDbDatabasesResponse {
  databases: RocksDbDatabaseInfo[];
}
```

Related Types

```
interface RocksDbDatabaseInfo {
  tablespace: string;
  dataDir: string;
  dbPath: string;
}
```

19.4 Compact Database

Compact database

URI Template

```
POST /api/archive/rocksdb/{tablespace}/{dbpath**}:compact
```

{tablespace}

{dbpath}**

Related Types

19.5 Describe Rocks Db

Get a text-dump with general RocksDB info

URI Template

```
GET /api/archive/rocksdb:describe
```

Related Types

19.6 Describe Database

Get a text-dump describing a database

This operation can be used to debug the inner workings of RocksDB database. For example the property rocksdb.estimate-table-readers-mem will provide an estimation of how much memory is used by the index and filter cache of RocksDB (note that the memory used by RocksDB is outside the java heap space).

See also: https://github.com/facebook/rocksdb/blob/master/include/rocksdb/db.h

The response contains a dump of various rocksdb properties for each column family. The single value properties are presented in a "name: value" list. The multiline properties are preceded by a line including the property name between dashes.

URI Template

```
GET /api/archive/rocksdb/{tablespace}/{dbpath**}:describe
```

{tablespace}

{dbpath}**

Related Types

CHAPTER

TWENTY

SERVER

Handles incoming requests related to api routes

20.1 Get Server Info

Get general server info

URI Template

```
GET /api
```

Response Type

```
interface GetServerInfoResponse {

  // Yamcs version derived on build time.
  yamcsVersion: string;

  // Yamcs SHA-1 revision identifier. Set on
  // build time, but only if the git command
  // was available.
  revision: string;

  // An identifier for this server. Used in
  // system parameters.
  serverId: string;

  // A default instance for this Yamcs installation.
  // This is a calculated suggestion. UI clients may ignore.
  defaultYamcsInstance: string;

  // Plugins loaded within this server instance
  plugins: PluginInfo[];

  // Additional options available to commands
  commandOptions: CommandOptionInfo[];
}
```

Related Types

```
interface PluginInfo {
  name: string;
  description: string;
  version: string;
  vendor: string;
}

interface CommandOptionInfo {
  id: string;
  verboseName: string;
  type: string;
  help: string;
}
```

20.2 List Routes

List routes

URI Template

```
GET /api/routes
```

Response Type

```
interface ListRoutesResponse {
  routes: RouteInfo[];
}
```

Related Types

```
interface RouteInfo {
  service: string;
  method: string;
  description: string;
  httpMethod: string;
  url: string;
  inputType: string;
  outputType: string;
  deprecated: boolean;
  requestCount: string;  // String decimal
  errorCount: string;  // String decimal
}
```

20.3 List Topics

List topics

URI Template

```
GET /api/topics
```

Response Type

```
interface ListTopicsResponse {
  topics: TopicInfo[];
}
```

Related Types

```
interface TopicInfo {
  topic: string;
  service: string;
  method: string;
  description: string;
  inputType: string;
  outputType: string;
  deprecated: boolean;
}
```

20.4 List Client Connections

List client connections

URI Template

```
GET /api/connections
```

Response Type

```
interface ListClientConnectionsResponse {
  connections: ClientConnectionInfo[];
}
```

Related Types

```
interface ClientConnectionInfo {
  id: string;
  open: boolean;
  active: boolean;
  writable: boolean;
  remoteAddress: string;
  readBytes: string;  // String decimal
  writtenBytes: string;  // String decimal
  readThroughput: string;  // String decimal
  writeThroughput: string;  // String decimal
  httpRequest: HttpRequestInfo;
}

interface HttpRequestInfo {
  protocol: string;
  method: string;
  uri: string;
  keepAlive: boolean;
  userAgent: string;
}
```

20.5 Close Connection

Close a client connection

URI Template

```
DELETE /api/connections/{id}
```

{id}

Related Types

```

```

CHAPTER

TWENTYONE

STREAM ARCHIVE

21.1 List Parameter Groups

List parameter groups

URI Template

```
GET /api/archive/{instance}/parameter-groups
```

{instance}

Response Type

```
interface ParameterGroupInfo {
  group: string[];
}
```

Related Types

21.2 List Parameter History

List parameter history

URI Template

```
GET /api/stream-archive/{instance}/parameters/{name*}
```

{instance} Yamcs instance name.

{name*} Parameter name.

Query Parameters

pos

The zero-based row number at which to start outputting results. Default: `0`.

limit

The maximum number of returned records per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`.

norepeat

Whether to filter out consecutive identical values. Default `no`.

start

Filter the lower bound of the parameter's generation time. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the parameter's generation time. Specify a date string in ISO 8601 format.

order

The order of the returned results. Can be either `asc` or `desc`. Default: `desc`.

norealtime

Disable loading of parameters from the parameter cache. Default: `false`.

processor

The name of the processor from which to use the parameter cache. Default: `realtime`.

source

Specifies how to retrieve the parameters. Either `ParameterArchive` or `replay`. If `replay` is specified, a replay processor will be created and data will be processed with the active Mission Database. Note that this is much slower than receiving data from the ParameterArchive.

Default: `ParameterArchive`.

next

Response Type

```
interface ListParameterHistoryResponse {
  parameter: ParameterValue[];
  continuationToken: string;
}
```

Related Types

```
interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
```

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```
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}

// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

enum Type {
  FLOAT = "FLOAT",
```

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```
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

21.3 Stream Parameter Values

Streams back parameter values

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/stream-archive/{instance}:streamParameterValues
```

{instance}

Request Body

```
interface StreamParameterValuesRequest {
  start: string;  // RFC 3339
  stop: string;  // RFC 3339
  ids: NamedObjectId[];
}
```

Response Type

```
interface ParameterData {
  parameter: ParameterValue[];

  // The next three fields are used by the recorder as unique key to store
  // parameters in "rows" and also by components that provide parameters
  // from external sources. The time should roughly correspond to the parameter
  // time but can be rounded for better efficiency.
  group: string;
  generationTime: string;  // String decimal
  seqNum: number;

  // Used when parameter data is delivered as result of subscriptions
  subscriptionId: number;
}
```

Related Types

```
// Used by external clients to identify an item in the Mission Database
// If namespace is set, then the name is that of an alias, rather than
// the qualified name.
interface NamedObjectId {
  name: string;
  namespace: string;
}

interface ParameterValue {
  id: NamedObjectId;
  rawValue: Value;
  engValue: Value;
  acquisitionTime: string;  // RFC 3339
```

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```
  generationTime: string;  // RFC 3339
  acquisitionStatus: AcquisitionStatus;
  processingStatus: boolean;
  monitoringResult: MonitoringResult;
  rangeCondition: RangeCondition;

  // same as the Timestamps above
  acquisitionTimeUTC: string;
  generationTimeUTC: string;

  // Context-dependent ranges
  alarmRange: AlarmRange[];

  // How long (in milliseconds) this parameter value is valid
  // Note that there is an option when subscribing to parameters to get
  // updated when the parameter values expire.
  expireMillis: string;  // String decimal

  // When transferring parameters over WebSocket, this value might be used
  // instead of the id above in order to reduce the bandwidth.
  // Note that the id <-> numericId assignment is only valid in the context
  // of a single WebSocket connection.
  numericId: number;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

interface AlarmRange {
  level: AlarmLevelType;
  minInclusive: number;
  maxInclusive: number;
  minExclusive: number;
  maxExclusive: number;
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
```

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```
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}

enum AcquisitionStatus {

  // OK!
  ACQUIRED = "ACQUIRED",

  // No value received so far
  NOT_RECEIVED = "NOT_RECEIVED",

  // Some value has been received but is invalid
  INVALID = "INVALID",

  // The parameter is coming from a packet which has not since updated although it␣
↪should have been
  EXPIRED = "EXPIRED",
}

enum MonitoringResult {
  DISABLED = "DISABLED",
  IN_LIMITS = "IN_LIMITS",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}

enum RangeCondition {
  LOW = "LOW",
  HIGH = "HIGH",
}

enum AlarmLevelType {
  NORMAL = "NORMAL",
  WATCH = "WATCH",
  WARNING = "WARNING",
  DISTRESS = "DISTRESS",
  CRITICAL = "CRITICAL",
  SEVERE = "SEVERE",
}
```

21.4 Get Parameter Samples

Get parameter samples

URI Template

```
GET /api/stream-archive/{instance}/parameters/{name*}/samples
```

{instance} Yamcs instance name.

{name*} Parameter name.

Query Parameters

start

Filter the lower bound of the parameter's generation time. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the parameter's generation time. Specify a date string in ISO 8601 format.

count

Number of intervals to use. Default: `500`.

norealtime

Disable loading of parameters from the parameter cache. Default: `false`.

processor

The name of the processor from which to use the parameter cache. Default: `realtime`.

source

Specifies how to retrieve the parameters. Either `ParameterArchive` or `replay`. If `replay` is specified, a replay processor will be created and data will be processed with the active Mission Database. Note that this is much slower than receiving data from the ParameterArchive.

Default: `ParameterArchive`.

Response Type

```
interface TimeSeries {
  sample: Sample[];
}
```

Related Types

```
interface Sample {
  time: string;
  avg: number;
  min: number;
  max: number;
  n: number;
}
```

21.5 Export Parameter Values

Export parameter values in CSV format

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
GET /api/archive/{instance}:exportParameterValues
```

{instance} Yamcs instance name.

Query Parameters

start

Filter the lower bound of the parameter's generation time. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the parameter's generation time. Specify a date string in ISO 8601 format.

parameters

The parameters to add to the export.

namespace

Namespace used to display parameter names in csv header. Only used when no parameter ids were specified.

extra

Extra columns added to the CSV output:

- `raw`: Raw parameter values
- `monitoring`: Monitoring status

Related Types

CHAPTER

TWENTYTWO

TABLE

Service for reading and writing to Yamcs tables and streams

22.1 Execute Sql

Execute SQL

URI Template

```
POST /api/archive/{instance}:executeSql
```

{instance} Yamcs instance name.

Request Body

```
interface ExecuteSqlRequest {

  // StreamSQL statement
  statement: string;
}
```

Response Type

```
interface ResultSet {
  columns: ColumnInfo[];
  rows: ListValue[];
}
```

Related Types

```
interface ColumnInfo {
  name: string;
  type: string;
  enumValue: EnumValue[];
}

interface EnumValue {
  value: number;
  label: string;
}
```

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```
interface ListValue {
  values: Value[];
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

22.2 Execute Streaming Sql

Execute streaming SQL

> **Warning:** This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}:executeStreamingSql
```

{instance} Yamcs instance name.

Request Body

```
interface ExecuteSqlRequest {

  // StreamSQL statement
  statement: string;
}
```

Response Type

```
interface ResultSet {
  columns: ColumnInfo[];
  rows: ListValue[];
}
```

Related Types

```
interface ColumnInfo {
  name: string;
  type: string;
  enumValue: EnumValue[];
}

interface EnumValue {
  value: number;
  label: string;
}

interface ListValue {
  values: Value[];
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
```

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```
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

22.3 List Streams

List streams

Note that this will only list the fixed columns of the stream. Tuples may always have extra columns.

URI Template

```
GET /api/archive/{instance}/streams
```

{instance} Yamcs instance name.

Response Type

```
interface ListStreamsResponse {
  streams: StreamInfo[];
}
```

Related Types

```
interface StreamInfo {
  name: string;
  column: ColumnInfo[];
  script: string;
  dataCount: string;  // String decimal
}

interface ColumnInfo {
  name: string;
  type: string;
  enumValue: EnumValue[];
}

interface EnumValue {
  value: number;
  label: string;
}
```

22.4 Subscribe Stream Statistics

Receive updates on stream stats

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `stream-stats`.

Input Type

```
interface SubscribeStreamStatisticsRequest {
  instance: string;
}
```

Output Type

```
interface StreamEvent {
  type: Type;
  name: string;
  dataCount: string;  // String decimal
}
```

Related Types

```
enum Type {
  CREATED = "CREATED",
  DELETED = "DELETED",
  UPDATED = "UPDATED",
}
```

22.5 Get Stream

Get a stream

URI Template

```
GET /api/archive/{instance}/streams/{name}
```

{instance}

{name}

Response Type

```
interface StreamInfo {
  name: string;
  column: ColumnInfo[];
  script: string;
  dataCount: string;  // String decimal
}
```

Related Types

```
interface ColumnInfo {
  name: string;
  type: string;
  enumValue: EnumValue[];
}

interface EnumValue {
  value: number;
  label: string;
}
```

22.6 Subscribe Stream

Receive stream updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `stream`.

Input Type

```
interface SubscribeStreamRequest {
  instance: string;
  stream: string;
}
```

Output Type

```
interface StreamData {
  stream: string;
  column: ColumnData[];
}
```

Related Types

```
interface ColumnData {
  name: string;
  value: Value;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}
```

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```
enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",

  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

22.7 List Tables

List tables

The response will only include fixed columns of the table. Tuples may always add extra value columns.

URI Template

```
GET /api/archive/{instance}/tables
```

{instance} Yamcs instance name.

Response Type

```
interface ListTablesResponse {
  tables: TableInfo[];
}
```

Related Types

```
interface TableInfo {
  name: string;
  keyColumn: ColumnInfo[];
  valueColumn: ColumnInfo[];
  script: string;
  histogramColumn: string[];
  storageEngine: string;
  formatVersion: number;
  tablespace: string;
  compressed: boolean;
  partitioningInfo: PartitioningInfo;
}

interface ColumnInfo {
```

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```
  name: string;
  type: string;
  enumValue: EnumValue[];
}

interface EnumValue {
  value: number;
  label: string;
}

interface PartitioningInfo {
  type: PartitioningType;
  timeColumn: string;
  timePartitionSchema: string;
  valueColumn: string;
  valueColumnType: string;
}

enum PartitioningType {
  TIME = "TIME",
  VALUE = "VALUE",
  TIME_AND_VALUE = "TIME_AND_VALUE",
}
```

22.8 Get Table

Get a table

URI Template

```
GET /api/archive/{instance}/tables/{name}
```

{instance} Yamcs instance name.

{name} Table name.

Response Type

```
interface TableInfo {
  name: string;
  keyColumn: ColumnInfo[];
  valueColumn: ColumnInfo[];
  script: string;
  histogramColumn: string[];
  storageEngine: string;
  formatVersion: number;
  tablespace: string;
  compressed: boolean;
  partitioningInfo: PartitioningInfo;
}
```

Related Types

```
interface ColumnInfo {
  name: string;
  type: string;
  enumValue: EnumValue[];
}

interface EnumValue {
  value: number;
  label: string;
}

interface PartitioningInfo {
  type: PartitioningType;
  timeColumn: string;
  timePartitionSchema: string;
  valueColumn: string;
  valueColumnType: string;
}

enum PartitioningType {
  TIME = "TIME",
  VALUE = "VALUE",
  TIME_AND_VALUE = "TIME_AND_VALUE",
}
```

22.9 Get Table Data

Get table data

URI Template

```
GET /api/archive/{instance}/tables/{name}/data
```

{instance} Yamcs instance name.

{name} Table name.

Query Parameters

cols

The columns to be included in the result. If unspecified, all table and/or additional tuple columns will be included.

pos

The zero-based row number at which to start outputting results. Default: `0` Note that in the current rocksdb storage engine there is no way to jump to a row by its number. This is why such a request will do a table scan and can be slow for large values of pos.

limit

The maximum number of returned records per page. Choose this value too high and you risk hitting the maximum response size limit enforced by the server. Default: `100`

order

The direction of the sort. Sorting is always done on the key of the table. Can be either `asc` or `desc`. Default: `desc`

Response Type

```
interface TableData {
  record: TableRecord[];
}
```

Related Types

```
interface TableRecord {
  column: ColumnData[];
}

interface ColumnData {
  name: string;
  value: Value;
}

// Union type for storing a value
interface Value {
  type: Type;
  floatValue: number;
  doubleValue: number;
  sint32Value: number;
  uint32Value: number;
  binaryValue: string;  // Base64
  stringValue: string;
  timestampValue: string;  // String decimal
  uint64Value: string;  // String decimal
  sint64Value: string;  // String decimal
  booleanValue: boolean;
  aggregateValue: AggregateValue;
  arrayValue: Value[];
}

// An aggregate value is an ordered list of (member name, member value).
// We use two arrays in order to be able to send just the values (since
// the names will not change)
interface AggregateValue {
  name: string[];
  value: Value[];
}

enum Type {
  FLOAT = "FLOAT",
  DOUBLE = "DOUBLE",
  UINT32 = "UINT32",
  SINT32 = "SINT32",
  BINARY = "BINARY",
  STRING = "STRING",
  TIMESTAMP = "TIMESTAMP",
  UINT64 = "UINT64",
  SINT64 = "SINT64",
  BOOLEAN = "BOOLEAN",
  AGGREGATE = "AGGREGATE",
  ARRAY = "ARRAY",
```

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```
  // Enumerated values have both an integer (sint64Value) and a string␣
↪representation
  ENUMERATED = "ENUMERATED",
}
```

22.10 Read Rows

Streams back the contents of all rows in key order

The `ColumnInfo` message assigns an integer `id` for each column and the `id` is present in each cell belonging to that column (this is done in order to avoid sending the `ColumnInfo` with each `Cell`). The column id starts from 0 and are incremented with each new column found. The ids are only valid during one single dump. The dumped data does not contain information on any table characteristics such as (primary) key, partitioning or other storage options.

Warning: This method uses server-streaming. Yamcs sends an unspecified amount of data using chunked transfer encoding.

URI Template

```
POST /api/archive/{instance}/tables/{table}:readRows
```

{instance} Yamcs instance name.

{table} Table name.

Request Body

```
interface ReadRowsRequest {

  // The columns to be included in the result. If unspecified, all
  // table and/or additional tuple columns will be included.
  cols: string[];
}
```

Response Type

```
interface Row {

  //the column info is only present for new columns in a stream of Row messages
  columns: ColumnInfo[];
  cells: Cell[];
}
```

Related Types

```
interface ColumnInfo {
  id: number;
  name: string;
  type: string;

  // The name of the class implementing the proto object if dataType is PROTOBUF
  protoClass: string;
}

interface Cell {
  columnId: number;
  data: string;  // Base64
}
```

22.11 Write Rows

Imports a stream of rows

The table has to exist in order to load data into it.

As soon as the server detects an error with one of the written rows, it will forcefully close the connection and send back an early error message. The client should stop streaming and handle the error.

Note that the erratic condition causes the connection to be closed even if the `Keep-Alive` request header was enabled.

The error response is of type `ExceptionMessage` and contains a detail message of type `WriteRowsExceptionDetail` that provides the number of rows that were successfully written by the client. The client can use this information to link the error message to a row (i.e. the bad row is at position `count + 1` of the stream).

One possible error could be that the table has defined a (primary) key and one of the loaded rows contains no value for one of the columns of the key.

Warning: This method uses client-streaming.

URI Template

```
POST /api/archive/{instance}/tables/{table}:writeRows
```

{instance} Yamcs instance name.

{table} Table name.

Request Body

```
interface Row {

  //the column info is only present for new columns in a stream of Row messages
  columns: ColumnInfo[];
  cells: Cell[];
}
```

Response Type

```
interface WriteRowsResponse {

  // The number of rows that were written
  count: number;
}
```

Related Types

```
interface ColumnInfo {
  id: number;
  name: string;
  type: string;

  // The name of the class implementing the proto object if dataType is PROTOBUF
  protoClass: string;
}

interface Cell {
  columnId: number;
  data: string;  // Base64
}
```

CHAPTER

TWENTYTHREE

TAG

23.1 List Tags

List tags

URI Template

```
GET /api/archive/{instance}/tags
```

{instance} Yamcs instance name.

Query Parameters

start

Filter the lower bound of the tag. Specify a date string in ISO 8601 format.

stop

Filter the upper bound of the tag. Specify a date string in ISO 8601 format.

Response Type

```
interface ListTagsResponse {
  tag: ArchiveTag[];
}
```

Related Types

```
interface ArchiveTag {
  id: number;
  name: string;
  start: string;  // String decimal
  stop: string;  // String decimal
  description: string;
  color: string;
  startUTC: string;  // RFC 3339
  stopUTC: string;  // RFC 3339
}
```

23.2 Get Tag

Get a tag

URI Template

```
GET /api/archive/{instance}/tags/{tagTime}/{tagId}
```

{instance} Yamcs instance name.

{tagTime}

{tagId}

Response Type

```
interface ArchiveTag {
  id: number;
  name: string;
  start: string;  // String decimal
  stop: string;  // String decimal
  description: string;
  color: string;
  startUTC: string;  // RFC 3339
  stopUTC: string;  // RFC 3339
}
```

Related Types

23.3 Create Tag

Create a tag

URI Template

```
POST /api/archive/{instance}/tags
```

{instance} Yamcs instance name.

Request Body

```
interface CreateTagRequest {

  // **Required.** The name of the tag.
  name: string;

  // The start time of the tag. Default is unbounded.
  start: string;

  // The stop time of the tag. Default is unbounded.
```

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```
  stop: string;

  // The description of the tag.
  description: string;

  // The color of the tag. Must be an RGB hex color, e.g. ``#ff0000``
  color: string;
}
```

Response Type

```
interface ArchiveTag {
  id: number;
  name: string;
  start: string;  // String decimal
  stop: string;  // String decimal
  description: string;
  color: string;
  startUTC: string;  // RFC 3339
  stopUTC: string;  // RFC 3339
}
```

Related Types

```

```

23.4 Update Tag

Update a tag

URI Template

```
PATCH /api/archive/{instance}/tags/{tagTime}/{tagId}
```

{instance} Yamcs instance name.

{tagTime}

{tagId}

Request Body

```
interface EditTagRequest {

  // The name of the tag.
  name: string;

  // The start time of the tag. Must be a date string in ISO 8601 format.
  start: string;

  // The stop time of the tag. Must be a date string in ISO 8601 format.
  stop: string;
```

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```
  // The description of the tag.
  description: string;

  // The color of the tag. Must be an RGB hex color, e.g. ``#ff0000``.
  color: string;
}
```

Response Type

```
interface ArchiveTag {
  id: number;
  name: string;
  start: string;  // String decimal
  stop: string;  // String decimal
  description: string;
  color: string;
  startUTC: string;  // RFC 3339
  stopUTC: string;  // RFC 3339
}
```

Related Types

23.5 Delete Tag

Delete a tag

URI Template

```
DELETE /api/archive/{instance}/tags/{tagTime}/{tagId}
```

{instance} Yamcs instance name.

{tagTime}

{tagId}

Response Type

```
interface ArchiveTag {
  id: number;
  name: string;
  start: string;  // String decimal
  stop: string;  // String decimal
  description: string;
  color: string;
  startUTC: string;  // RFC 3339
  stopUTC: string;  // RFC 3339
}
```

Related Types

CHAPTER

TWENTYFOUR

TIME

24.1 Get Leap Seconds

Get UTC leap seconds

URI Template

```
GET /api/leap-seconds
```

Response Type

```
interface LeapSecondsTable {
  ranges: ValidityRange[];
}
```

Related Types

```
interface ValidityRange {
  start: string;
  stop: string;
  leapSeconds: number;
  taiDifference: number;
}
```

24.2 Set Time

Set (simulation) time of an instance

URI Template

```
POST /api/instances/{instance}:setTime
```

{instance}

Related Types

24.3 Subscribe Time

Receive time updates

WebSocket

This method requires to upgrade an HTTP connection to WebSocket. See details on *how Yamcs uses WebSocket* (page 3).

Use the message type `time`.

Input Type

```
interface SubscribeTimeRequest {
  instance: string;
  processor: string;
}
```

Output Type

```
// A Timestamp represents a point in time independent of any time zone or local
// calendar, encoded as a count of seconds and fractions of seconds at
// nanosecond resolution. The count is relative to an epoch at UTC midnight on
// January 1, 1970, in the proleptic Gregorian calendar which extends the
// Gregorian calendar backwards to year one.
//
// All minutes are 60 seconds long. Leap seconds are "smeared" so that no leap
// second table is needed for interpretation, using a [24-hour linear
// smear](https://developers.google.com/time/smear).
//
// The range is from 0001-01-01T00:00:00Z to 9999-12-31T23:59:59.999999999Z. By
// restricting to that range, we ensure that we can convert to and from [RFC
// 3339](https://www.ietf.org/rfc/rfc3339.txt) date strings.
//
// # Examples
//
// Example 1: Compute Timestamp from POSIX `time()`.
//
//     Timestamp timestamp;
//     timestamp.set_seconds(time(NULL));
//     timestamp.set_nanos(0);
//
// Example 2: Compute Timestamp from POSIX `gettimeofday()`.
//
//     struct timeval tv;
//     gettimeofday(&tv, NULL);
//
//     Timestamp timestamp;
//     timestamp.set_seconds(tv.tv_sec);
//     timestamp.set_nanos(tv.tv_usec * 1000);
//
```

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```
// Example 3: Compute Timestamp from Win32 `GetSystemTimeAsFileTime()`.
//
//     FILETIME ft;
//     GetSystemTimeAsFileTime(&ft);
//     UINT64 ticks = (((UINT64)ft.dwHighDateTime) << 32) | ft.dwLowDateTime;
//
//     // A Windows tick is 100 nanoseconds. Windows epoch 1601-01-01T00:00:00Z
//     // is 11644473600 seconds before Unix epoch 1970-01-01T00:00:00Z.
//     Timestamp timestamp;
//     timestamp.set_seconds((INT64) ((ticks / 10000000) - 11644473600LL));
//     timestamp.set_nanos((INT32) ((ticks % 10000000) * 100));
//
// Example 4: Compute Timestamp from Java `System.currentTimeMillis()`.
//
//     long millis = System.currentTimeMillis();
//
//     Timestamp timestamp = Timestamp.newBuilder().setSeconds(millis / 1000)
//         .setNanos((int) ((millis % 1000) * 1000000)).build();
//
//
// Example 5: Compute Timestamp from current time in Python.
//
//     timestamp = Timestamp()
//     timestamp.GetCurrentTime()
//
// # JSON Mapping
//
// In JSON format, the Timestamp type is encoded as a string in the
// [RFC 3339](https://www.ietf.org/rfc/rfc3339.txt) format. That is, the
// format is "{year}-{month}-{day}T{hour}:{min}:{sec}[.{frac_sec}]Z"
// where {year} is always expressed using four digits while {month}, {day},
// {hour}, {min}, and {sec} are zero-padded to two digits each. The fractional
// seconds, which can go up to 9 digits (i.e. up to 1 nanosecond resolution),
// are optional. The "Z" suffix indicates the timezone ("UTC"); the timezone
// is required. A proto3 JSON serializer should always use UTC (as indicated by
// "Z") when printing the Timestamp type and a proto3 JSON parser should be
// able to accept both UTC and other timezones (as indicated by an offset).
//
// For example, "2017-01-15T01:30:15.01Z" encodes 15.01 seconds past
// 01:30 UTC on January 15, 2017.
//
// In JavaScript, one can convert a Date object to this format using the
// standard
// [toISOString()](https://developer.mozilla.org/en-US/docs/Web/JavaScript/
↪Reference/Global_Objects/Date/toISOString)
// method. In Python, a standard `datetime.datetime` object can be converted
// to this format using
// [`strftime`](https://docs.python.org/2/library/time.html#time.strftime) with
// the time format spec '%Y-%m-%dT%H:%M:%S.%fZ'. Likewise, in Java, one can use
// the Joda Time's [`ISODateTimeFormat.dateTime()`](
// http://www.joda.org/joda-time/apidocs/org/joda/time/format/ISODateTimeFormat.
↪html#dateTime%2D%2D
// ) to obtain a formatter capable of generating timestamps in this format.
interface Timestamp {

  // Represents seconds of UTC time since Unix epoch
  // 1970-01-01T00:00:00Z. Must be from 0001-01-01T00:00:00Z to
  // 9999-12-31T23:59:59Z inclusive.
  seconds: string;  // String decimal

  // Non-negative fractions of a second at nanosecond resolution. Negative
```

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```
  // second values with fractions must still have non-negative nanos values
  // that count forward in time. Must be from 0 to 999,999,999
  // inclusive.
  nanos: number;
}
```

Related Types