OPNFV HA API’s
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Carrier Grade Availability API’s

- VM Heartbeating & Health Checking
  - simple validation of kernel scheduling, and/or
  - application-specific health checks.

- VM Event Acknowledgement / Notification
  - VM can reject Event based on current state (e.g. not sync’d),
  - VM can prepare Event (e.g. by persisting critical data).
  - Supported VM Events: shutdown, migrate, reboot, pause and suspend.

- VM Peer State Notification & Messaging
  - State change notifications of VMs within server group, and
  - Simple broadcast messaging mechanism between VMs within server group.

- VM Guest Scaling
  - notification of add/remove of vCPU,
  - allows proper OS online/offline of vCPU, and selection of specific vCPU to offline.

- Available on GitHub
  - API Specification, and
  - Reference Implementation.

- Simple “JSON over Serial Interface” API
Open-Source Host-to-Guest Messaging API

- **Guest SDK Modules (Heartbeat, Scaling and Server Group Messaging)**
  - Provides an Open Solution where Guest VM can interact with the host for improvements in manageability and reliability
  - Provide Open Messaging API between Host and Guest VM
    - JSON-over-Serial_Interface (very similar to REST API model)
    - Simple light weight API such that the guest doesn’t need a full IP stack to communicate with the host.
  - Reference Implementation of Guest-side Software; NOT mandatory.

- **Messaging API Documentation and Guest Reference Implementation distributed as open-source on GIT HUB**
  - https://github.com/Wind-River/titanium-server
Open-Source Host-to-Guest Messaging API

- Virtio Serial Device Transport Layer
  - Standard Linux QEMU/KVM feature
  - http://www.linux-kvm.org/page/Virtio-serial_API,
  - supported by both Linux and Windows Guests
  - QEMU creates & presents a virtio-pci device to the Guest,
  - Guest Virtio Drivers present a char device interface
to Guest user-space applications
  - generally, very similar to communicating via a pipe or a SOCK_STREAM socket.

- JSON-formatted Application Layer
  - Line Delimited JSON Format
  - e.g. \n{key:value,key:value,...}\n  - Well-Defined Application Layer Message Types and Fields
    - e.g.
      - Init, Init-Ack, Exit
      - Challenge-Request, Challenge-Response
      - Action-Notify-Request, Action-Notify-Response
  - Easily parse-able by any high-level language.

Heartbeat Challenge Request and Response

A Heartbeat Challenge Request from Host to the Guest:

```
\n"version":2,"revision":1,"msg_type":"challenge","sequence":12,"heartbeat_challenge":278722862}\n```

The corresponding Heartbeat Challenge Response from the Guest:

```
\n"version":2,"revision":1,"msg_type":"challenge_response","sequence":30,"heartbeat_response":278722862,"heartbeat_health":"healthy","corrective_action":null,"log_msg":"File /tmp/unhealthy does not exist."\n```
Git Hub reference

• Git Hub site:
  • https://github.com/Wind-River/titanium-server

• Full SDK available on Git Hub
  • Portable Guest API SDK
  • Open protocol for Guest to Host messaging
  • Open portable JSON wrapper with reference implementation for C based applications
    • Python and other languages to follow in the future
  • Reference implementation of guest daemons and client libraries