

# **Hyper Protect Virtual Servers**

## **Wildfire Workshop**

### **IBM Hyper Protect Virtual Servers**

### **GREP11 Introduction**

Barry Silliman  
IBM Washington Systems Center  
[silliman@us.ibm.com](mailto:silliman@us.ibm.com)

# IBM Hyper Protect virtual servers

*A secure virtualization platform that protects your critical Linux® applications during build, deployment, and management lifecycle phases on IBM Z® and LinuxONE*



## Build applications with integrity

*Leverage the secure image build process to sign images, validate code, and integrate into your CI/CD pipeline*



## Deploy workloads with trust

*Validate the provenance of your applications before deployment*



## Manage applications with simplicity

*Manage your infrastructure without visibility to sensitive code or data – RESTful API deployment*

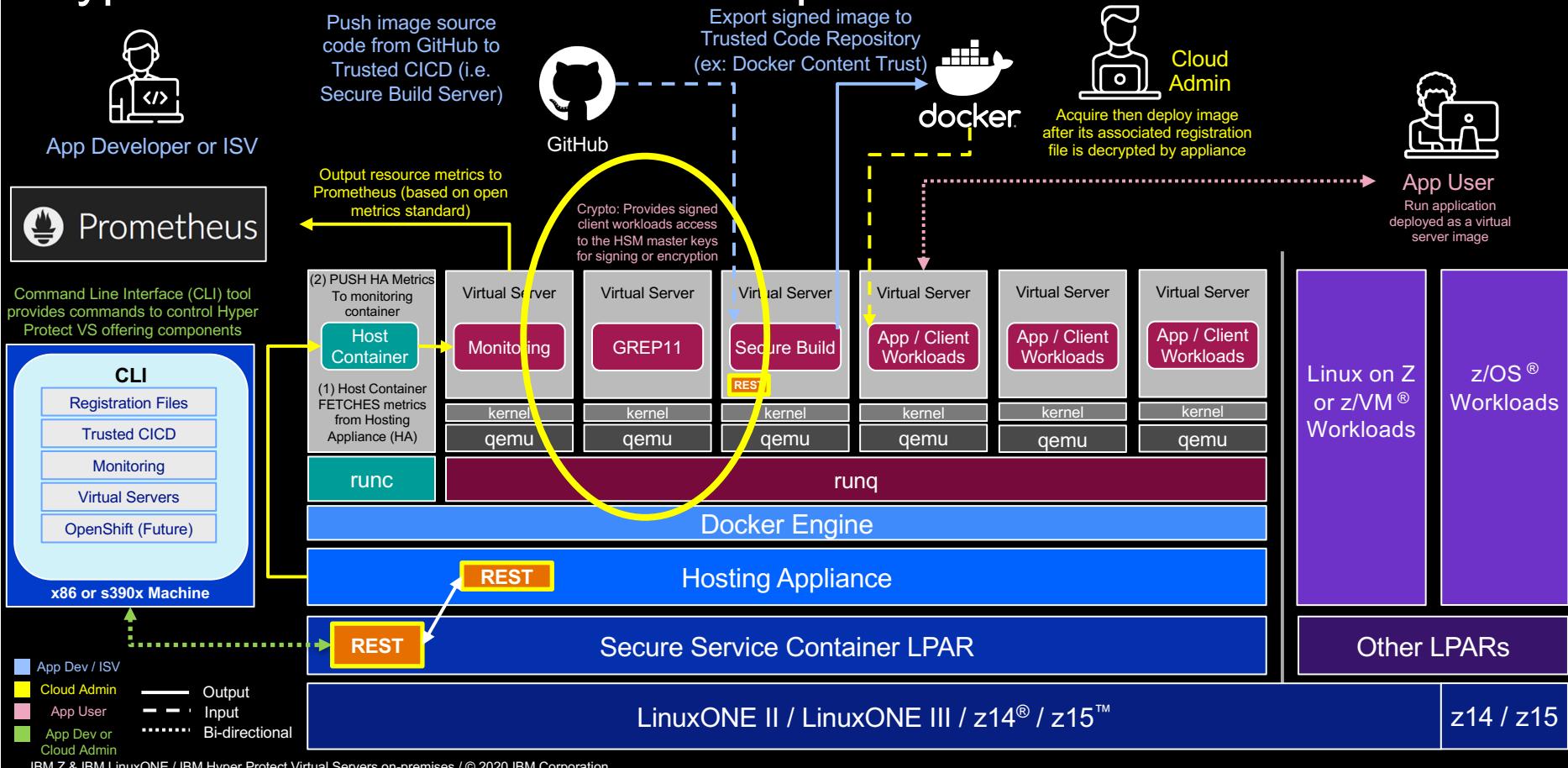


## Encrypt & Sign critical solution components

*Give your images access to the industry leading FIPS 140-2 level 4 Hardware Security Module for signing and encryption needs*



# Hyper Protect virtual servers on-premises – Architecture



# Crypto Express card setup notes

- Card must be defined in EP11 mode
  - mode is set at the card level
  - 85 domains per card
- Assign one or more domains from one or more cards to the SSC LPAR that is hosting Hyper Protect Virtual Servers
- Trusted Key Entry (TKE) Workstation with Smart Card Reader support is required to load an EP11 Master Key into a domain
  - Domain grouping available to perform single operation on all domains in the group (e.g., loading a master key)

# GREP11 server setup notes

- A GREP11 server connects to one HSM domain
- GREP11 server is stateless
- GREP11 server Docker image is supplied with the Hyper Protect Virtual Servers offering
- Instructions are provided in offering Knowledge Center to set up ecosystem for creating certificates for mutual Transport Layer Security (TLS) authentication
- `hyps crypto list`
  - “online” indicates the domain is available
  - “in-use” indicates the domain is allocated to a GREP11 server
- `hyps deploy` or `hyps vs create`
  - Deploy syntax is simpler but it uploads GREP11 server Docker image file each time

# GREP11 server connection information

- GREP11 server hostname or IP
- GREP11 server listening port
- Certification Authority certificate
- GREP11 server private key
- GREP11 server TLS certificate

## GREP11 client connection information

- GREP11 server hostname or IP
- GREP11 server listening port
- Certification Authority certificate
- Client private key
- Client TLS certificate

In lab, look in `golang/examples/server_test.go` and in `golang/lab/callopts.go` to see this information.

# Application development resources

- Enterprise PKCS#11 (EP11) Library Structure
  - <https://www.ibm.com/downloads/cas/WXRDPRAN>
- IBM developer works sample GREP11 client code
  - <https://github.com/ibm-developer/ibm-cloud-hyperprotectcrypto>
- Lab sample GREP11 client code (based on IBM Developer works sample)
  - <https://github.com/silliman/ibm-cloud-hyperprotectcrypto>
- GREP11 API Reference
  - <https://cloud.ibm.com/docs/hs-crypto?topic=hs-crypto-grep11-api-ref>

# Systems administrator resources

- Secure Service Container User's Guide (SC28-7005-01)
  - <https://www.ibm.com/support/pages/ibm-z-secure-service-container-users-guide>
- Trusted Key Entry Workstation 9.2 User's Guide
  - <https://www-01.ibm.com/servers/resourcelink/svc00100.nsf/pages/zOSV2R4sc147511?OpenDocument>
- Trusted Key Entry video series
  - [https://www.youtube.com/watch?v=CD4KNT6E0\\_E&list=PLezLS0Tuqb-7zuJN9KldA728tGh08bREo](https://www.youtube.com/watch?v=CD4KNT6E0_E&list=PLezLS0Tuqb-7zuJN9KldA728tGh08bREo)
- GREP11 server setup in Hyper Protect Virtual Servers
  - [https://www.ibm.com/support/knowledgecenter/SSHPMH\\_1.2.x/topics/create\\_grp11.html](https://www.ibm.com/support/knowledgecenter/SSHPMH_1.2.x/topics/create_grp11.html)

# Lab tips – Getting started with SkyTap

Browse to this URL: <http://ibm.biz/hpvsSeats>

Look for your name in the table, click the URL next to your name in the SkyTap URL table to access your assigned SkyTap Ubuntu image

Enter your unique SkyTap password

Lab instructions are in the GREP11 Lab section at the URL listed above

The Firefox browser is on your Ubuntu lab image

Browse the instructions from within your image, or from a browser on your host operating system, whichever you prefer

## SkyTap tips

Password for the SkyTap Ubuntu image is `zrbxKx24svr` (the hardest part of the lab is typing that in)

If necessary, click the “Fit to Window” icon in your SkyTap task bar near the top to enlarge the Ubuntu desktop window (the icon looks like a terminal with a diagonal double-arrow from lower left to upper right)

“your mileage may vary”, but Ctrl-C and Ctrl-V may not work for copy and paste within the window, but right-clicking with your mouse should let you copy and paste

# Getting started with the lab

Lab instructions are in the *GREP11 Lab* section at <https://ibm-wsc.github.io/hyper-protect-virtual-servers-workshop>

- The Firefox browser is on your Ubuntu lab image
- Browse the instructions from within your image, or from a browser on your host operating system, whichever you prefer

Follow the instructions in order, when you reach the bottom of each section, you'll be at a navigation frame at the bottom of your browser window, and you can easily navigate to the next section

Start a terminal session in your SkyTap Ubuntu image (icon on the left that looks like a terminal) from where you will enter commands at the start of the lab (and throughout if you prefer this to using the terminal within Visual Studio Code).

## Lab navigation tips

All commands to enter are in a box and have a copy icon to the right of them.

Most, but not all commands, show example output. The box showing example output has a collapse/expand arrow to the right. Output that is relatively short may already be expanded for you. Some of the longer outputs are collapsed by default but you can expand it.

For one section only, “How to set up a GREP11 server”, do not enter the commands shown- this setup has already been done for you. (This is mentioned in the lab).

## Lab notes

Don't be shy about offering suggestions for improvements, or even to point out typos or other errors

- [silliman@us.ibm.com](mailto:silliman@us.ibm.com)
- Open a GitHub issue or pull request from the lab if you're comfortable using GitHub (click the pencil icon at the top right of each page to get started on opening an issue)

## SkyTap survey

Please take the survey from SkyTap to provide feedback to them about your experience using SkyTap (referred to in the survey as Workshop Manager). *It is very brief.*

The link for this SkyTap survey will be in our lab at the end, and is also available here:

<https://www.surveygizmo.com/s3/5541805/Workshop-Manager-Survey?ws=https://ibm.biz/Bdq3TL>

# Thank you

Barry Silliman  
Consulting IT Specialist  
IBM Washington Systems Center

[silliman@us.ibm.com](mailto:silliman@us.ibm.com)



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