

"What do NEPs Need in Virtualization Solutions to Spur Adoption & Deployment?"

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About SCOPE

- The **SCOPE Alliance** is a non-profit industry alliance aiming at accelerating the deployment of carrier grade base platforms for service provider applications. Its mission is to enable and promote the availability of open carrier grade base platforms based on commercial off-the-shelf (COTS) hardware / software and Free and open-source software (FOSS) building blocks, and to promote interoperability between such components.

Sponsors



Contributors

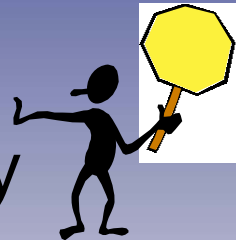


Supporters



SCOPE Virtualization Working Group

- NEP usage & deployment of virtualization solutions generally seen lagging IT industry
- Why? Some thoughts:
 - Performance & reliability concerns
 - Limitations in existing H/W
 - Perception of a lack of solutions targeting NEP market (requirements not fully understood)
- The SCOPE virtualization working group aimed to address these concerns, thereby accelerating NEP virtualization adoption



SCOPE Virtualization Working Group

■ History & Milestones

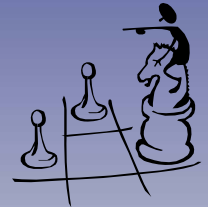
- Agreement of “Virtualization Effort” approved by BoD mid 2006.
- First working meeting Feb. 2007
- Work products published Apr. 2008



■ This was an atypical SCOPE group: leadership came predominantly from contributor members, not sponsor (NEP) members

- Provides some insight into NEP progress/uptake on virtualization!

SCOPE Virtualization Working Group



- The approach taken by the team (aka “The Three Sisters of Virtualization”):
 - Education/level set:
 - “Virtualization: State of the Art” document
 - Usage Models:
 - “Virtualization: Use Cases” document
 - Features:
 - “Virtualization: Requirements” document
- All three documents available in PDF format from SCOPE website:
 - <http://www.scope-alliance.org>

Virtualization: State of the Art

- Provides a general overview & taxonomy of virtualization technologies, with a focus on system virtualization.
- Includes a lengthy glossary of terms and abbreviations used in this space.
- Serves as a baseline and establishes “common language” for subsequent SCOPE virtualization publications.



Virtualization: Use Cases

- This document attempts to provide insight into the potentially unique and varied use of virtualization in the NEP space.
- A total of seventeen use cases were identified, some with multiple variants (e.g. UC 1A, UC 1B) to accommodate different virtualization technologies (e.g. H/W virtualization, O/S virtualization).
 - Not an exhaustive set
 - Further additions and refinements are likely as the technology matures, and its adoption in the NEP space increases.

Virtualization: Use Cases (Continued)

- A few examples of SCOPE virtualization use cases:
 - “Deployment or consolidation of highly available NEP applications on clusters of OS-based virtual machines” (UC 3B)
 - “Migration of virtual machines from one physical server to another without loss of service” (UC 9)
 - “Dynamic assignment or re-assignment of VM resources” (UC 12)
 - “In-service upgrade of VMM (hypervisor) software independent of the underlying VMs (UC 14)
- Others: legacy OS support, capacity extension, data plane use, multi-tenant hosting.





Virtualization: Requirements

- The “Requirements Document” details the functional needs underlying each use case (and any notable requirement captured during the group discussion process).
- Requirements were grouped into a set of 11 “buckets” or categories:
 - Definition, Activation, Operation, Fault Handling, Administration, Deployment, Operation
 - Security, Performance, Availability, Live Migration*
- In total, 96 requirements were identified across these 11 categories.

*Live migration is seen as a lower priority than the other requirements, to be further reviewed upon the maturation of the technology

Virtualization: Requirements (Continued)



- Some examples of requirements which may be unique to the NEP space include:
 - Support for real-time and non-real time workload
 - Inclusion of QoS requirements in VM definition facility
 - Programmatic access to VM administration operations (active, pause, suspend, shutdown, etc.)
 - Ability to detect VM crash and take configurable actions
 - Access to key performance indicators on a per VM basis
 - Automated out-of-service and in-service upgrades with remote progress indicators (+ upgrades in 4 hour maintenance window)
 - Backwards compatibility of virtualization solutions



Is SCOPE Finished with Virtualization?



- No; we're really just getting started!
- Topics identified for further (or more detailed) study:
 - Failure handling
 - Resource management
 - Administration
 - Performance
 - Availability
 - Security
- If you're a member of SCOPE, willing & interested, we'd love your help!



Related Topics

- Virtualization and I/O
- Interactions Between SAF HA API and Virtualization Facilities
- Virtualization and Power Management

Questions?

