NITEC 18

NCI Agency Industry Conference and AFCEA TechNet International

DCIS Cube

Bringing agility and scalability back to the Deployable Communications and Information System (DCIS)

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Recap of NITEC17 (1/3)

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- **Today:**
  - Current DCIS equipment is NATO owned, old, limited in number, tied up…
  - The current exercise and operation preparation approach is “artisanal” and not scalable;
  - Exercise tempo and number is rapidly increasing;
  - Not unthinkable that we might have to prep multiple operations;
  - VJTF (new) has very short activation times;
  - We have to take account of degraded communications (reach back).
- **Soon:**
  - We can handle large number of exercises in parallel;
  - We can handle simultaneous operation start-ups;
  - We can match VJTF activation times for early entry.

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Recap of NITEC17 (2/3)
Conceptual Illustration (hypothetical)

- **Suppose that…**
  - We define a number of “templated” capability bundles and stacks;
  - These are fully virtualized (including SDN);
  - They are “live” in our cloud, prepped for network configuration, being patched and maintained…
  - We have selected a couple of sources for “bare metal” bricks;
  - We have retainer contracts with suppliers;
  - We don’t own the HW, we always have a couple on premises, always recent;
  - When we get “the call”, we select an image, drop it on the on-premise box, validate and ship, call off the next one…
  - We have a similar “on call” approach for (early entry) SATCOM (and bandwidth) to “ship it there and activate” on demand (but using our crypto)…
  - We have accessible, standing instances of FMN (current and next spiral) for pre-testing by Nations and their industry…
- **This is a business innovation as much as a technical innovation!**

Recap of NITEC17 (3/3)
NATO sought to engage with industry to….

- Build an architecture team with us to develop and build a set of “DCIS Cube” prototypes;
- Help to develop a cost / benefit case;
- Possibly support an innovation incubator initiative;
- To achieve a DCIS for NATO that has:
  - lower TCO;
  - faster setup;
  - easier to configure and deploy;
  - FMN compliant;
  - multi-tenancy(Security classifications & Community of Interest);
  - based on COTS industry components;
  - uses latest technologies, e.g. hyper converged fabric, SDN, SDDC, hypervisors, containerization, etc.

Between July 2017 - March 2018
NCIA and Industry completed a DCIS architecture that is:

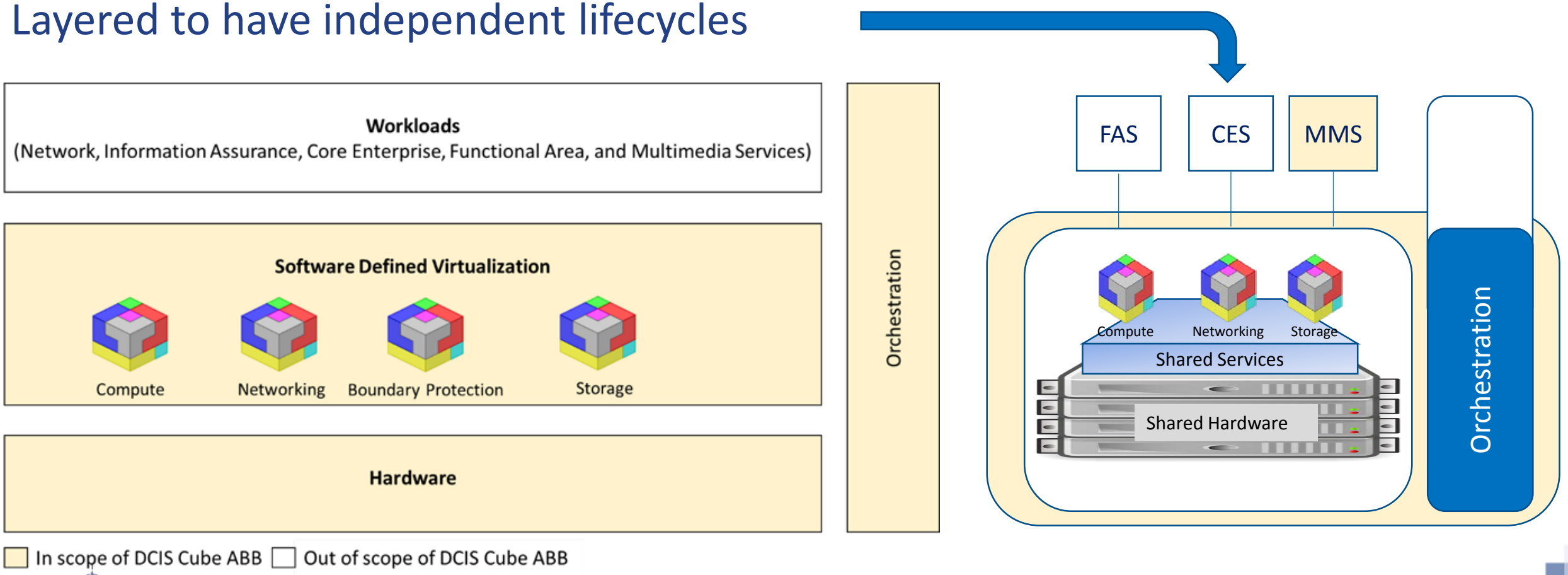
- Software-Defined & Orchestrated through:
  - Software Defined Network (SDN), Software Defined Storage (SDS), Infrastructure as a Service (IaaS)
  - Templating & managed automation of service provisioning
- Virtualized across the complete OSI stack (layers 1 -7), including
  - switches, routers and boundary protection (firewalls, instruction detection, etc.)
- Using hyper-converged and virtualized architectures to the maximum extent possible
  - hypervisors, but not limited to one platform only;
  - user services based on micro services through containerization.
- Hardware and software agnostic
  - condensed, high performance hardware using COTS standard hardware, using only x86 technology for all OSI layers (wherever possible)
  - sufficient, and scalable, hardware and software appliance resilience
  - weight of the ruggedized hardware kit low as possible (~50kg)
- Aligned with FMN.

Industry partners in DCIS Cube architecture development:

Indirect contributions by:

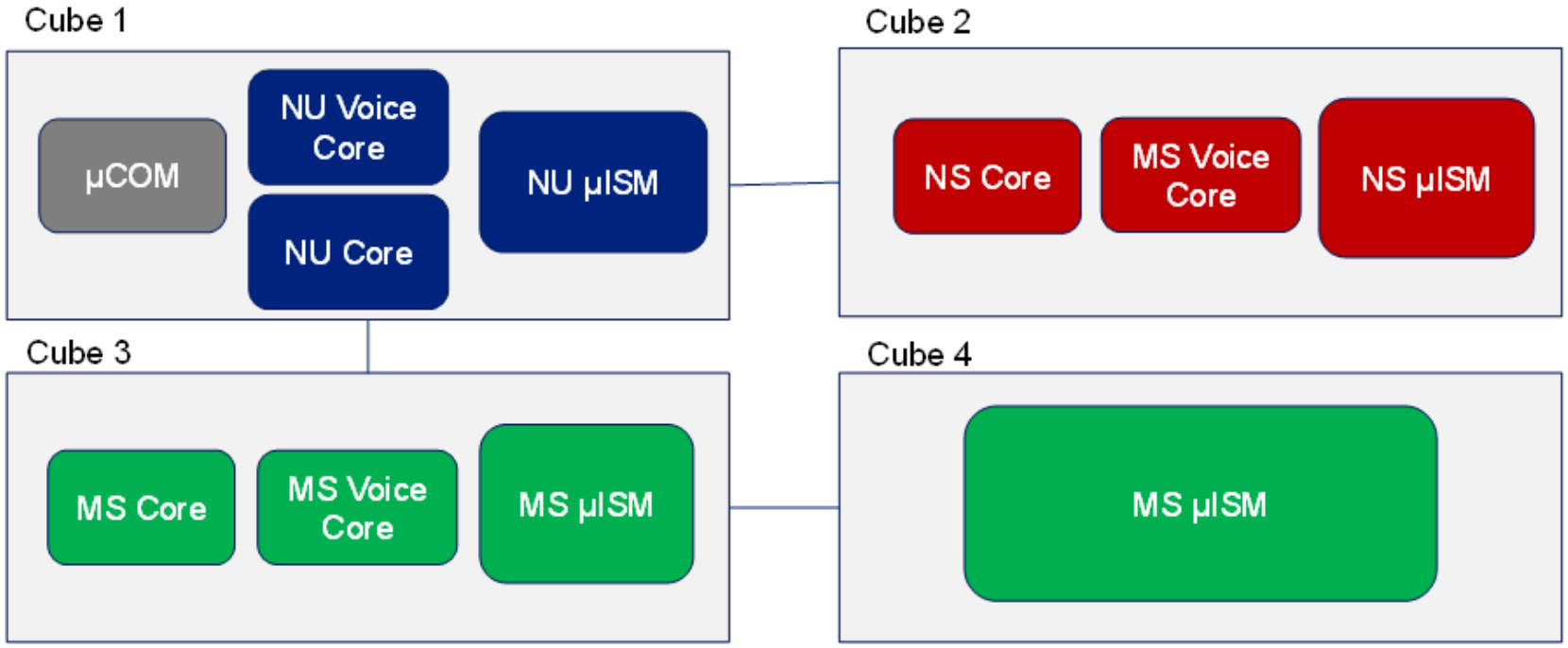
DCIS Cube Architecture (1/2)

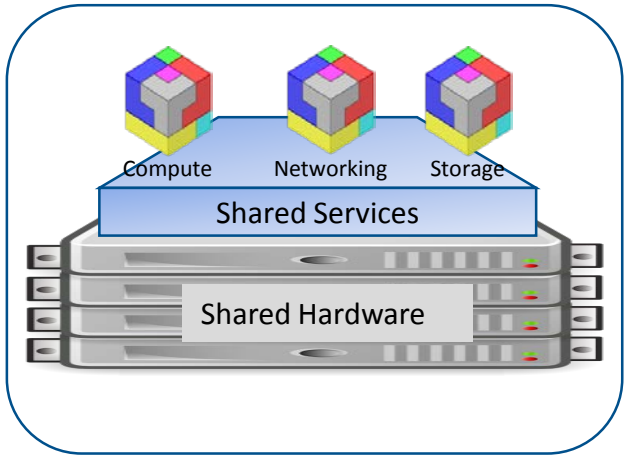
Layered to have independent lifecycles



DCIS Cube Architecture (2/2)

- Notional allocation of the virtual DCIS Modules to 4 DCIS Cubes
- Orchestration is key, it gives each Cube its identity





Status

- DCIS Cube Architecture Definition Document complete
- White Paper describing the DCIS Cube at https://dcis-cube.org
- Prototype validation based on:
  - 9 prototypes
  - covering 20 criteria
- Addressing ability to accredit virtual firewalls in NATO

- *Ready to go…*

Next steps (1/2)
DCIS Cube 2.0 and beyond

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Focus Areas:

- Accreditation of virtualized firewalls
- Multi-tenancy:
  - Different CoI, different Mission domains and ultimately NATO and Mission classified on one Cube
  - Considering technologies such as HyTrust, trusted hardware platforms and encryption
- FAS-aware Backup and Disaster Recovery
- Virtualization of (Type-1) Crypto

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Next steps (2/2)
DCIS Cube 2.0 and beyond

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Focus Areas:

- Include VDI – Thin Client Support
- Software-Defined Wide Area Networking (SDWAN)
- Wireless LAN/MAN:
  - High speed, robust, secure (crypto)
- Model Driven Orchestration of user-facing services
  - Automated and managed deployment of FAS and CES,
  - including all dependencies across the OSI stack
- Software Containers
  - Micro services, automated scale-out/scale-in

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Discussion!

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