Smart Applications on Virtual Infrastructure

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What is SAVI?

• Proposed NSERC Strategic Network
• Partnership of industry, universities, R&E networks, HPC centres, government
• 10 universities: 15 professors; 50 grad students
• $9m over 5 years
• Currently in final evaluation stage
SAVI Vision: To enable an open applications marketplace

- Converged computing & communications infrastructure
- Cloud computing extends to a service provider smart edge
- All infrastructure resources are virtualized and managed using Infrastructure-as-a-Service
- Large-scale distributed applications can be rapidly deployed on virtualized infrastructure
- First Step: Design a converged network testbed to support an academic cloud
• High-bandwidth mobile apps
• Sensors and data collection
• Dense small cells inside and out
• Agile long reach optical backhaul
• Energy-proportional access

• Media rich and intelligent enabling services
• Balance between smart edge and remote cloud
• Virtualized routing/datacenters
• Autonomic management for on-demand capacity, energy efficiency and sustainability
1. Smart Applications
   - Reusable frameworks for rapid deployment of high-potential applications
   - Data-intensive apps
   - Mobile event-driven apps
   - Media apps

2. Extended Cloud Computing
   - Adaptive resource management to support applications across extended cloud
   - Balancing smart edge & remote datacenter
   - Storage & data services for multi-tiered applications

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- **Wireless/Optical Access**
- **Smart Edge**
  - Virtualized Router & Datacenter
- **Backbone/Core**
- **Massive-Scale Datacenters**

*Columbia River Facility*
3. Smart Converged Edge
   - Virtualized converged network & computing infrastructure at smart edge
   - Support for Future Internet protocols
   - Services & support for apps
   - Design & mgmt of virtual converged networks

4. Integrated Wireless Optical Access
   - Virtualized radio-over-fiber integrated with dense small cells
   - Energy-proportional capacity management
   - Integration with the smart edge
SAVI Testbed

- Virtualizable converged cluster
  - Hybrid of router & compute cluster
  - Offers VMs, net processing, FPGA
- Highly programmable & Extremely scalable
- Rides commodity technology curve
- Uses Ethernet substrate initially
- Deploy testbeds to offer converged VN
  - ORION, CANARIE & HPC’s
- Offer reusable frameworks for apps

10GE fabric

Computing
Net Processing
FPGAs

10GE fabric

Ethernet Wide Area Network

Access through IP tunnels

EU-Canada Future Internet Workshop
Collaborations Sought

- Learn & share experience with others
- Services & applications on clouds
- Future Internet
- Wireless & optical access
- Testbed design, deployment, management