

The Cost of IPv6



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BETTER

Outline



- Deployment Cost
 - Data Center/Host/Content
 - ISP
 - Enterprise
- Operational Cost
 - Develop
 - Test
 - Operate/Troubleshoot

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Deployment Cost – Data center/hosting/content



- draft-lopez-v6ops-dc-ipv6
- Firewalls, Routers, Load balancers, Switches, security appliances
 - Security appliances: **Money**
- Servers
 - Front-end
 - Back-end
- Customer apps: **Development dollars**
 - Web site
 - Mail
 - Portals
 - Sales
 - Streaming
- Monitoring: **Development dollars**
 - For each app above

Capital expenditures are reduced if spread over a longer period of time, when upgrades were planned anyway.
So, start four years ago and it's cheap.



Deployment Cost - ISP

- RFC6782 Wireline Incremental IPv6
- Backbone - \$0 if network is less than ten years old
- Access Network – may require controller/line card upgrades. **Money**
- Data Center (see Data Center/hosting)
- Provisioning/OSS - \$0 capital, some labor to customize/config
 - Billing fields (IPv6 y/n)
 - Customer device provisioning (modem, voice, video)
 - Firmware management
 - Configuration management
 - Monitoring
 - Portals
 - Provisioning OSS
 - Outage ticketing system
 - Customer trouble ticketing system
- CPE - **Money**

Capital expenditures are reduced if spread over a longer period of time, when upgrades were planned anyway.
So, start four years ago and it's cheap.



Deployment Cost - Enterprise

- draft-ietf-v6ops-enterprise-incremental-ipv6
- External
 - Access provider
 - WAN
 - Data center/hosting
 - Anti-spam
 - Monitoring
- Internal
 - LANs
 - Workstations
 - Peripherals
 - Server room



Operational Costs - ISP

- Develop
 - New router/code? Test twice (or maybe three times):
 - IPv4
 - Dual-stack
 - IPv6
 - Probably 10% additional work; once the plan exists, repeating is incremental
- Test
 - Test twice
 - 10% incremental work
- Operate/Troubleshoot
 - Layer 1/Layer 2 problems: 1% incremental (ping6 OK? Also do ping)
 - Layer 3: 5% (ping6 OK? Also ping, troubleshoot)

Operational costs - Data center/hosting/content



- Develop
 - Apps – develop and unit test
 - IPv4
 - Dual-stack
 - IPv6
 - 10-30% additional work; once the plan exists, repeating is incremental
- Test
 - Test twice
 - 10% incremental work
- Operate/Troubleshoot
 - Layer 1/Layer 2 problems: 1% incremental (ping6 OK? Also do ping)
 - Layer 3: 5% (ping6 OK? Also ping, troubleshoot)



Operational Costs - Enterprise

- Systems, Workstations, Peripherals
 - IPv4
 - Dual-stack
 - IPv6
 - Probably 10% additional work; once the plan exists, repeating is incremental
- Support
 - Low incremental, few backhoes in the office building

Summary



	Deploy	Operate
Data center Hosting Content	Labor: Applications CapEx: Security Either: Monitoring	+5-10% annually
ISP	CapEx: Access routers CapEx: CPE Labor: P/OSS	+5-10% annually
Enterprise	CapEx: Cheap Labor: Lots to do	+1% annually

DISCUSSION