



NTT Communications Group
NTT America, Inc

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NTT BGP Configuration Size and Scope

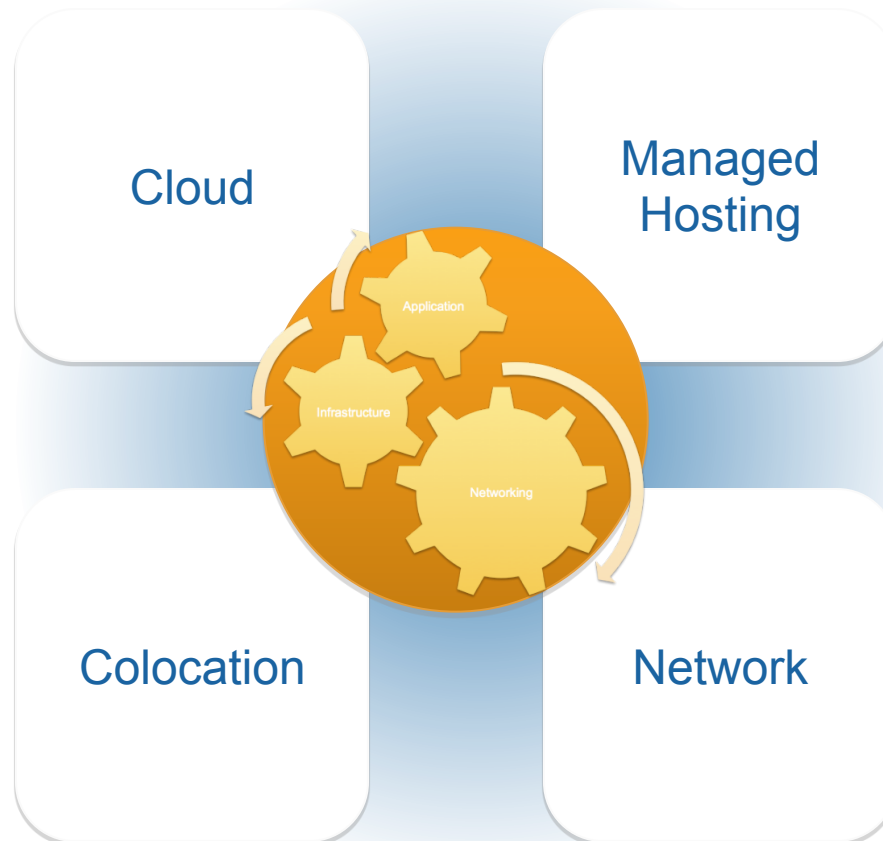
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Global IP Engineering

**NTT Communications delivers consistent IP
connectivity globally**



- NTTA Cloud
- NTTA Enterprise Cloud



- Managed Servers
- Managed Security
- Managed Data Services
- Managed Network Services
- Managed Virtualization
- Managed Applications

- Managed Colocation
- Managed Data Services
- Managed Security Services
- Customer Premise Device Management

- Managed Private Network:
 - MPLS IP VPN
 - Private Line
 - Global Ethernet
- Internet Networking:
 - IPv6 & IPv6/IPv4 Dual Service
 - CDN Services
 - DDoS Countermeasures
 - Layer 2 VPN Service

**Note: Integration/Professional Services: added service/overlay for all products*

2011

Typical Router configuration

1000-225k lines

Average: 30k lines

Top 50% average 57.2k lines

2013

Typical Router configuration

1000-473k lines (2.1x)

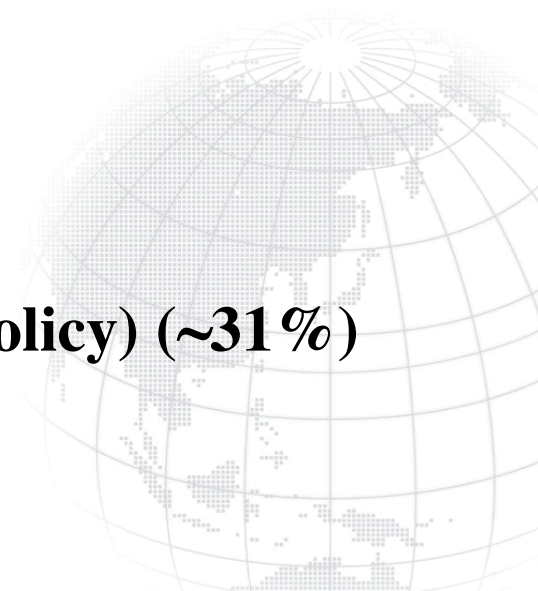
Average: 79k lines (2.6x)

Top 50% average 155k lines (2.7x)



IOS 2011 - Sample configuration breakdown: r01.chwahk02.hk.bb

- **7 BGP peers (external)**
- **9 non-infrastructure interfaces**
- **17 total interfaces (configured)**
- **78,711 lines of configuration**
- **76,362 lines of prefix-list (96%)**
- **2349 lines of non prefix-list**
 - **467 lines interfaces (~19%)**
 - **16 lines AAA configuraiton**
 - **219 lines community-list (~9%)**
 - **219 lines “router bgp” (~9%)**
 - **734 lines route-map, community-list (policy) (~31%)**
 - **...**



XR (2013) Sample configuration breakdown: r04.miamfl02.us.bb

- **7 BGP peers (external)**
- **24 physical infrastructure interfaces**
- **14 Bundle-Ether interfaces**
- **6 Loopback interfaces**
- **78 non-infrastructure interfaces (Customer, Peer)**
 - **33 subinterfaces underneath the 78 physical non-phy**
- **169 total interfaces (configured)**
- **270,822 lines of configuration**
- **260,826 lines of prefix-set (96.3%)**
- **8742 lines of non prefix-list**
 - **1484 lines interfaces (~17%)**
 - **378 lines community-set(~4%)**
 - **2549 lines “router bgp” (~29%)**
 - **2846 lines route-policy (~32%)**
 - **167 lines access-list (v6, v4)**
 - **... other stuff ...**



- **Configuration growth poses challenge**
- **Denser routers will continue to see size increase**
- **Parsing of configuration very CPU intensive**
- **Lack of optimization poses challenge**
- **Inefficient generation of prefixes from tools**
 - **IRR, others**
 - **At least one expands to nearly full DFZ**
- **Operational impact of configuration updates**
 - **Scheduler Slips**
 - **Commit times > 5 minutes**



Questions? Abuse?

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