

The Modern Data Center Network Checklist

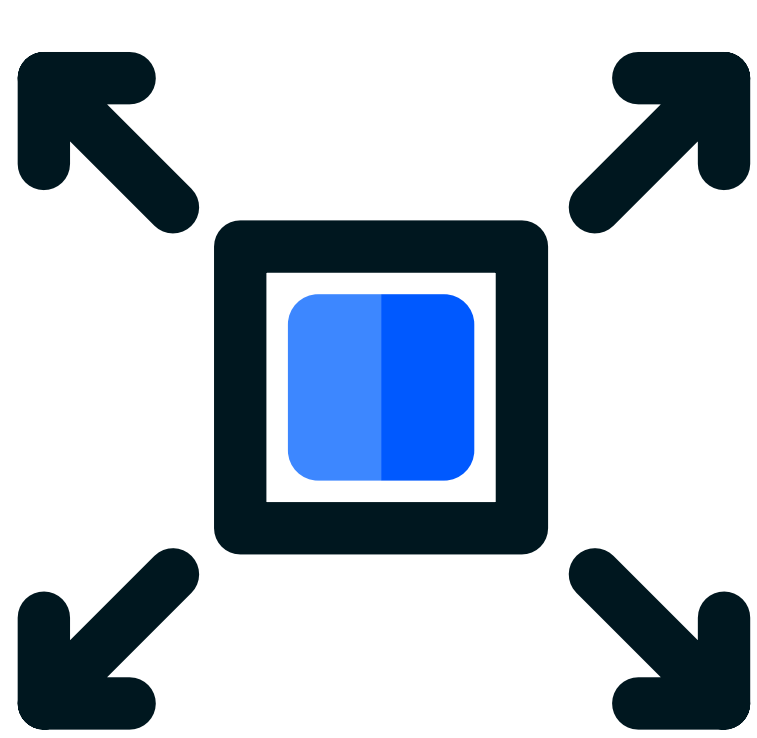
A recent study by [Futurum Research](#) unveiled the key trends driving decision making in networking data centers. Today's data center operators need modern data center networks to keep up with the rapid growth and rapidly-evolving requirements of data centers. When preparing to build or refresh your data center, you should evaluate and use the latest generally-accepted technologies, protocols, and operational tools to ensure that your organization's business requirements are met by your data center buildout, and that you are prepared for the future.

Business Requirements



Reliability

Maximum uptime
Dependable performance
Risk mitigation



Scalability

Aligned with business demands
Elastic network scale-out
Support multi-tenancy and growth

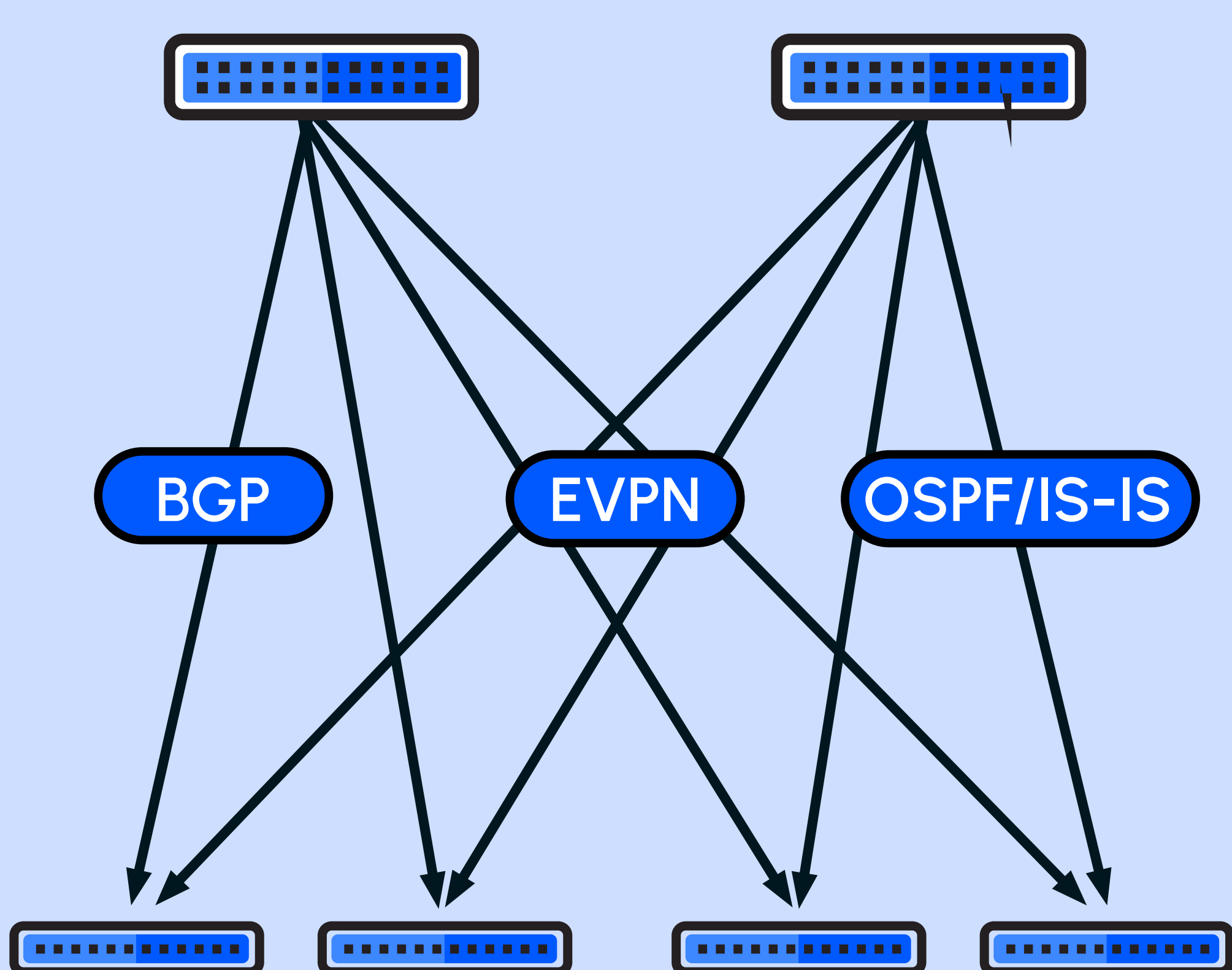


TCO alignment

Lower operations costs
Reduce manual effort
Eliminate human errors

Architectural Requirements

Modern Architecture



- ✓ **Design innovations:**
Cloud-native, microservices based NOS; modern management plane
- ✓ **Focus on quality:**
Reliability focused HW/NOS design; rigorous, production level testing
- ✓ **Fabric:**
Leaf-spine Clos fabric; L3 underlay + programmable overlay; IPv4/IPv6 dual-stack
- ✓ **Modern NOS:**
Modern software architecture; Linux forms a proven base
- ✓ **Routing stack:**
EVPN-VXLAN; BGP control-plane; IS-IS/OSPF underlay; Multicast
- ✓ **Segmentation:**
VRFs; DMZ-like separation; microsegmentation support

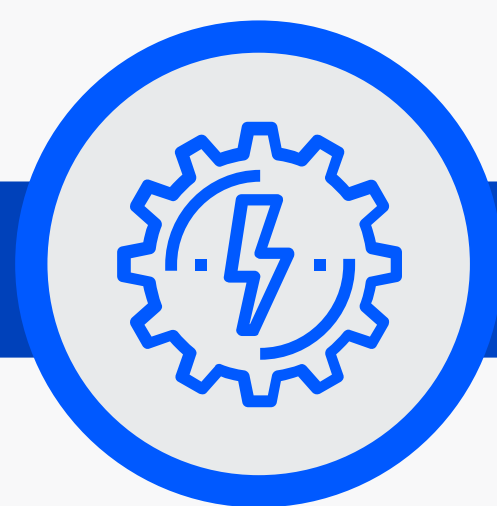
- ✓ **Silicon and systems:**
Modern merchant + fit-for-purpose custom silicon; high-density chassis
- ✓ **Speeds and feeds:**
800G-ready today, 1.6 Tbps by 2026; flexible Leaf/ToR speeds (1/10/25/40/100G/400G, breakouts where needed)
- ✓ **Latency and ordering:**
Microsecond-class fabric latency; in-order per-flow delivery; burst tolerance with adequate buffering and minimal jitter
- ✓ **Host access:**
Redundant, concurrently-active links

Operational Requirements



Guiding principle:

Provide tools and implement practices that drive predictable and accurate operations



Automation-first AIOps:

Empower existing staff via AIOps; enable full operational capability via API without CLI; ZTP support



Telemetry and observability:

Modern streaming telemetry; availability/capacity/perf monitoring; human-readable fabric visualization; customizable dashboards and reports



Logging and audit:

Centralized logs; config backup; full HW/SW/license inventory export

Open APIs:

Well-documented and flexible for future-proof integrations

Digital twin:

Sandbox for change simulation and "what-if" analysis; cloud-hosted management preferred

Integrations:

Seamless operation with current ITSM and trouble ticketing systems; event correlation, auto-ticketing, and ticket consolidation

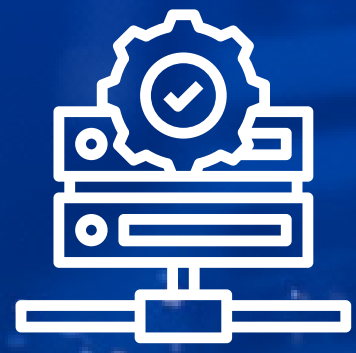
Summary

Not all data center networks are the same, but common architecture (spine-leaf) and merchant packet forwarding silicon have shifted the focus to the NOS, management systems, and tools that promote holistic and automated data center network operations. Beyond your speeds and feeds, make sure you consider all of your operations tools and procedures in a unified way that will drive accurate and predictable operations.

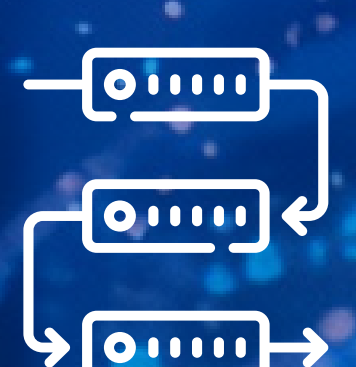
Accuracy



Precise configurations and correct problem diagnosis



Accurate network setup or correctly logged trouble tickets



Error-free data flow

Predictability



Stable, repeatable outcomes



Reliability over time — performance you can trust



Consistent uptime or response times

Read the Futurum Research report [here](#)