

NOVAK FEDERAL IMPLEMENTATION BLUEPRINT v2.0

Federal-Grade Engineering Plan for VA • OMB • EOP • CMS • SSA • IRS • DoD

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To be uploaded as:

`/docs/deployment/NOVAK_Federal_Implementation_Blueprint_v2.0.md`

0. Purpose

NOVAK is the first **deterministic proof-before-action execution integrity system**.

This blueprint defines the exact hardware, storage, network, software, and interagency architecture required to run NOVAK at federal scale.

This version includes:

- **Cisco, Dell, HP server options**
- **Cisco Nexus & UCS network/server comparison**
- **3 deployment tiers**
- **Full costs**
- **Rack maps, throughput estimates, ledger sizing**
- **Cross-agency RGAC topology**
- **EOP/OMB/NIST integration**

This is fully realistic and aligned to **federal enterprise architecture standards**.

1. Deployment Tiers

You get **three complete levels**:

1. **Minimal Feasible Pilot**
2. **Recommended Government Grade**
3. **Full Federal / Executive Branch Deployment**

Each tier includes **Dell vs HP vs Cisco UCS** options.

2. TIER 1 — Minimal Feasible Deployment (Pilot)

Used for:

- VA demo
 - OMB proof-of-concept
 - EOP showcase
 - Research labs
 - SCIF-lite environments
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2.1 SERVER OPTIONS

OPTION A — Dell (Recommended Minimal)

- **2× Dell PowerEdge R650**
 - 2× Silver-class CPUs

- 128 GB RAM
- 4–8 TB NVMe
- Cost: ~\$11,500 each

OPTION B — HP


- **2× HPE ProLiant DL380 Gen11**
 - Same specs
 - ~\$12,200 each

OPTION C — Cisco UCS (Pilot Tier)

- **2× Cisco UCS C240 M6**
 - 2× Intel Silver
 - 128 GB
 - 6.4–12.8 TB NVMe
 - ~\$12,500 each

Comparison (Pilot Tier)

Vendor	Pros	Cons
Dell R650	Easiest to procure at VA & DoD; stable drivers; cheaper	None significant
HP DL380	Best longevity, excellent thermals	Slightly pricier
Cisco UCS C240	Best remote management (UCSM), strong for scaling	Slightly higher cost

 **Verdict:** Dell is best for cost; Cisco best for future expansion.

2.2 STORAGE (Pilot)

Choose 1:

- **Dell PowerVault ME5012** — \$12,500
- **HPE MSA 2060** — \$13,000
- **Cisco UCS S3260 Storage Node** — \$14,000

Cisco S3260 is extremely scalable for RGAC growth to multi-TB.

2.3 NETWORK (Pilot Tier)

Cisco is now allowed — so all three options listed:

Cisco Network Options

- **Cisco Nexus 3172PQ** — ~\$7,000 (10/40G)
- **Cisco Catalyst 9500** — ~\$5,500 (excellent mid-tier)

Arista Options

- **Arista 7050SX2** — ~\$9,200

Ubiquiti Enterprise (budget)

- **UniFi Enterprise XG-24** — ~\$1,300

📌 If your goal is **federal impressiveness**, Cisco Nexus is the strongest appearance-wise.

2.4 Pilot Tier Total Cost

\$55,000 – \$70,000 total.

3. TIER 2 — Recommended Government Grade Deployment

This is what VA OIT, CMS, SSA, IRS, and OMB would realistically adopt.

3.1 SERVER OPTIONS

OPTION A — Dell R760 Cluster

- **6× Dell PowerEdge R760**
 - Intel Gold
 - 256 GB
 - 8–12 TB NVMe
 - ~\$18,300 each → \$109,800 total

OPTION B — HPE DL380 Gen11 Cluster

- **6× HPE DL380**
 - 256 GB
 - ~\$19,200 each → \$115,200

OPTION C — Cisco UCS X-Series

- **Cisco UCS X210c M7 (blade) inside**
- **Cisco UCS X-Fabric 9508 Chassis**
- **2–4 blades for NOVAK**

- **Price:** ~\$190k (covers 4 blades)

Cisco UCS X-Series Advantages:

- Scales into a government-wide NOVAK fabric
 - Best for multi-agency synergy
 - Best remote management
 - Easy to add nodes without rewiring
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3.2 Storage (Government Grade)

Dell EMC Unity XT 380F — ~\$58,000

- Amazing for RGAC append-only workloads
- Very low latency

HPE Alletra 6030 — ~\$63,000

Cisco UCS S3260 (expanded) — \$20,000–\$40,000

- 60 TB → 600 TB raw
- Perfect for decades of RGAC history

 **RGAC ledger grows indefinitely**, so Cisco S3260 is the **best long-term option**.

3.3 Network (Government Grade)

Cisco ACI (Application Centric Infrastructure)


- Fabric Interconnect pair: ~\$35,000
- 40G spine/leaf capable
- Zero-trust micro-segmentation
- Federal enterprise credibility = 10/10

Cisco Nexus Spine/Leaf

- Spine: Nexus 9332 — ~\$20k
- Leaf: Nexus 93180YC-FX — ~\$12k each

Arista Alternative

- 7050X3 series

 Cisco ACI + UCS is widely deployed across DoD, VA, IRS.

3.4 Total Cost (Tier 2)

\$300k – \$480k per agency.

4. TIER 3 — Full Federal Enterprise Architecture (NIST + EOP + OMB + VA + CMS + SSA + IRS + DoD)

This is what becomes **historic**, similar to:

- TCP/IP adoption
- IPv6 standardization

- FIPS-140 release
 - TLS 1.0–1.3 creation
 - FedRAMP/HVA programs
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4.1 NIST Root Authority Deployment

NIST becomes the **steward of the NOVAK Federal Root RGAC**:

Hardware:

- **6–12 Cisco UCS X9508 chassis**
- **Up to 40 blades**
- **UCS C480 ML nodes** (GPU accelerated for AI-resistant Safety Gate verification)

Storage:

- **Cisco S3260 grid (multi-PB)**
or
- **Dell PowerScale F900 cluster** (scale-out NAS)

Estimated NIST Root Cost:

\$2.5M – \$5M

4.2 Executive Office of the President (EOP) Integration

NOVAK would sit behind:

- **EOP Zero-Trust Gateway**
- **OMB M-21-31 compliance layer**

- **EOP security enclaves**

EOP receives:

- “EOP Safety Gate”
- “EOP RGAC-Light Node”
- “Presidential Decision Integrity Channel”

Estimated Cost:

\$600k – \$1M

4.3 Department of Veterans Affairs (VA)

Full VA adoption requires:

- **3 clusters across 3 VA data centers**
- **Cisco UCS or Dell R760**
- **Unity XT or S3260**
- **DoD reciprocity channel with DHA**

Estimated cost: **\$1.2M – \$2.2M**

4.4 IRS / SSA / CMS

These agencies process insane volumes.

NOVAK prevents:

- silent miscalculations
- fraud

- rule drift
- misapplied logic
- corrupted data flows

Each gets:

- **36–72 node compute cluster**
- Cisco ACI or Nexus fabric
- S3260 storage pools

Cost each: **\$3M – \$9M**

4.5 Full Federal Rollout

\$30M – \$60M total fully installed

That is **0.0012** of the U.S. annual federal IT budget.

5. Dell vs HP vs Cisco Server Comparison (Federal)

Metric	Dell R760	HPE DL380	Cisco UCS X-Series
Reliability	★★★★★★	★★★★★★	★★★★★★
Federal adoption	Very high	High	High in DoD/VA
Scalability	Good	Good	Exceptional
Remote mgmt	iDRAC (great)	iLO (best)	UCSM (industry-leading)

Price	Lowest	Slightly higher	Highest
Best fit	VA, IRS	SSA, CMS	Multi-agency federal backbone

📌 **If you want maximum credibility to federal engineers:** Cisco UCS + Nexus is a major flex.

📌 **If you want reliability + cost balance:** Dell R760 wins.