

UNIT 5

Procurement Plan for Enterprise Network Setup

(6 Hours) — Network Administration (CACS406)

⚠ Please Note

These notes were prepared with the help of AI from the TU BCA syllabus and general knowledge. They may contain errors, omissions or outdated details. Please verify important points against your textbook, class notes and the latest TU syllabus before relying on them in an exam.

5.1 Introduction to Procurement

Procurement is the process of finding, evaluating, buying and receiving the hardware, software and services needed to build a network. A **procurement plan (document)** is the written plan that states *what* will be bought, *how many*, *to what specification*, *from whom*, *at what cost* and *by when*. For an enterprise network it is prepared after the design is complete and before any purchase is made.

- **Why it matters:** prevents over- or under-buying, controls cost, ensures compatibility, gives a fair and transparent selection and a record for audit.
- **Who is involved:** network administrator (technical specification), management/finance (budget approval), purchasing department, and vendors/suppliers.
- **In Nepal:** government and public bodies follow the Public Procurement Act and Regulation (bidding through the PPMO e-GP system); private companies use their own policy but usually still compare at least three quotations.

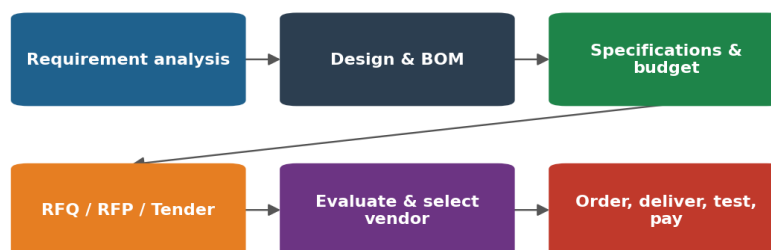


Figure 5.1 — Procurement life cycle for a network project

5.2 Steps in Preparing a Procurement Plan

5.2.1 Step 1 — Understand Requirements

- Number of users, departments, floors/buildings and sites; expected growth in 3–5 years.
- Applications and services needed (email, file, web, database, ERP, VoIP, CCTV, Wi-Fi, internet, remote access).
- Performance, availability (uptime target), security and compliance needs.
- Existing equipment that can be reused; building/cabling survey; power and space availability.

5.2.2 Step 2 — Prepare Design and Bill of Materials (BOM)

The **Bill of Materials** lists every item with quantity: cables, racks, patch panels, switches, routers, firewall, access points, servers, storage, UPS, software and licences, plus services such as installation, training and support. Add **10–20% spare** for cables, ports and critical spares.

5.2.3 Step 3 — Write Technical Specifications

Specifications must be **clear, measurable and vendor-neutral** (do not name only one brand unless justified). Give the minimum requirement and required standards.

Item	Example specification points
Access switch	24/48 × 10/100/1000 ports, PoE+ on required ports, 2–4 × 10G SFP+ uplinks, VLAN 802.1Q, STP/RSTP, port security, SNMPv3, managed, rack-mountable
Core/distribution switch	Layer 3, 10/25G uplinks, stacking or redundancy, inter-VLAN routing, OSPF, dual power supply
Router / Firewall	Throughput (Mbps/Gbps) with security features on, number of VPN tunnels, HA support, IPS/URL filtering, dual WAN
Wi-Fi access point	Wi-Fi 6 (802.11ax), dual band, PoE powered, WPA3/802.1X, controller or cloud management
Server	CPU cores/GHz, RAM (ECC), disks and RAID level, dual PSU, redundant NICs, remote management (iDRAC/iLO), rack size (1U/2U)
Cabling	Cat6/Cat6A UTP (ANSI/TIA-568), OM3/OM4 or OS2 fibre for backbone, patch panels, labelled and certified
UPS / Power	kVA rating with 20–30% headroom, runtime at full load, online double-conversion for servers, generator link
Software	OS and server licences (per core/CAL), antivirus/EDR, backup software, monitoring tool, subscription term

5.2.4 Step 4 — Estimate Cost and Budget

Consider the **Total Cost of Ownership (TCO)**, not just the purchase price:

TCO = Purchase cost + Installation + Licences/Subscriptions + Support & Maintenance + Power/Cooling + Training + Upgrades – Resale value

Example 5.1 — Simple budget calculation

A small office network needs: 2 × 48-port switches at Rs. 90,000 each; 4 × 24-port switches at Rs. 45,000 each; 1 firewall at Rs. 250,000; 8 Wi-Fi access points at Rs. 18,000 each; cabling and labour lump sum Rs. 400,000. Add 13% VAT on all items. Find the total.

Solution

Switches 48-port: $2 \times 90,000 = 180,000$

Switches 24-port: $4 \times 45,000 = 180,000$

Firewall: 250,000

Access points: $8 \times 18,000 = 144,000$

Cabling and labour: 400,000

Subtotal = $180,000 + 180,000 + 250,000 + 144,000 + 400,000 = \text{Rs. } 1,154,000$

VAT 13% = $1,154,000 \times 0.13 = 150,020$

Total = $1,154,000 + 150,020 = \text{Rs. } 1,304,020$

Note: Prices above are only for practice of the calculation; real prices change often and must be taken from current vendor quotations. Check the current VAT rate and import duty rules.

5.2.5 Step 5 — Choose Procurement Method and Prepare Documents

Document	Meaning	Used when
RFI — Request for Information	Ask vendors for general information about products/solutions	Early stage, market survey
RFQ — Request for Quotation	Ask for price for clearly defined items	Standard products, price is main factor
RFP — Request for Proposal	Ask vendors to propose a solution and price	Complex projects where design is open
Tender / Bid (ITB)	Formal, sealed, competitive bidding under rules	Large or public purchases

Document	Meaning	Used when
Purchase Order (PO)	Formal order sent to the selected vendor	After selection; makes the purchase legally binding

5.2.6 Step 6 — Evaluate Vendors and Select

- **Compliance check:** does the offer meet all mandatory technical specifications, company registration, tax clearance?
- **Technical scoring:** quality, brand reputation, features, scalability, warranty, local support and spare parts.
- **Financial comparison:** compare total price and TCO, payment terms, delivery time.
- **Vendor background:** past similar projects, references, certified engineers, after-sales service in Nepal.
- Use a **weighted scoring matrix** and record the reason for selection.

Example 5.2 — Weighted vendor scoring

Weights: Technical 40%, Price 40%, Support 20%. Vendor A scores Technical 80, Price 70, Support 90. Vendor B scores Technical 90, Price 60, Support 70. Which vendor is better?

Solution

Vendor A = $0.40 \times 80 + 0.40 \times 70 + 0.20 \times 90 = 32 + 28 + 18 = 78$

Vendor B = $0.40 \times 90 + 0.40 \times 60 + 0.20 \times 70 = 36 + 24 + 14 = 74$

Vendor A has the higher weighted score and is selected.

5.2.7 Step 7 — Contract, Delivery, Testing and Payment

- **Contract/PO terms:** item list, price, delivery date, warranty period, SLA, penalty for delay, payment schedule, training and documentation.
- **Delivery:** check items against the packing list and BOM; record serial numbers in the asset register.
- **Acceptance testing:** test cabling (certification reports), throughput, redundancy, Wi-Fi coverage, and services before signing acceptance.
- **Payment:** pay in stages (advance, on delivery, after acceptance, retention until warranty ends).
- **Handover:** as-built diagrams, configuration backups, passwords, manuals, training, support contacts.

5.3 Structure of a Procurement Plan / Document

A typical procurement document for an enterprise network setup contains the following sections:

No.	Section	Content
1	Title and introduction	Project name, organisation, prepared by, date, version
2	Background and objectives	Why the network is needed, scope, expected benefits
3	Requirement summary	Users, sites, services, performance and security requirements
4	Network design summary	Topology diagram, IP/VLAN plan, list of services
5	Bill of Materials with specifications	Item-wise description, quantity, unit and total cost
6	Budget and funding	Cost estimate, TCO, contingency (about 5–10%)
7	Procurement method and schedule	RFQ/tender, timeline of purchase, delivery and installation
8	Vendor selection criteria	Mandatory conditions, scoring matrix
9	Terms and conditions	Warranty, SLA, payment, penalties, training, support
10	Risks and assumptions	Delays, price change, compatibility, mitigation
11	Approval	Signatures of prepared by / reviewed by / approved by

5.4 Sample Procurement Plan (Mid-size Company Network)

Scenario

ABC Company is setting up a new 3-floor head office for 120 employees with a small server room, Wi-Fi in all floors and a secure internet connection with a backup link. Services required: file server, email (cloud), domain controller, web/ERP application, backup, CCTV and IP phones.

S.N.	Item	Qty	Key specification	Remarks
1	Core/distribution switch (L3)	2	24×10G SFP+, stacking/redundant PSU	For redundancy
2	Access switch	6	48 × 1G PoE+, 4×10G uplink, managed	2 per floor
3	Wi-Fi 6 access point	12	Dual band, PoE, WPA3, central management	4 per floor
4	Firewall (UTM) with HA	2	≥ 2 Gbps threat throughput, VPN, IPS	Active-passive pair

S.N.	Item	Qty	Key specification	Remarks
5	Rack server	3	2U, 2×CPU, 64 GB ECC RAM, RAID 10, dual PSU	DC, file, ERP/app
6	NAS backup storage	1	8 bays, RAID 6, 10G NIC	Local backup + cloud copy
7	Server rack 42U + PDU	1	Lockable, cooling fans, cable management	Server room
8	UPS online	2	10 kVA, ≥ 30 min at load, SNMP card	Server room + network
9	Precision/split AC	2	Redundant cooling for server room	N+1
10	Structured cabling	1 lot	Cat6, ~300 points, patch panels, fibre backbone, certified	Includes labelling
11	Software / licences	1 lot	Windows Server + CALs, antivirus, backup, monitoring	Subscription term 3 years
12	Services	1 lot	Installation, configuration, training, 1-year support	Vendor

Schedule (example): Week 1 – approve plan; Week 2–3 – RFQ and vendor evaluation; Week 4 – purchase order; Week 5–8 – delivery and cabling; Week 9–10 – installation, configuration, testing; Week 11 – training and handover.

Risks and mitigation: import delay → order early and use local stock alternatives; price/exchange-rate change → fix price validity in the quotation; compatibility problems → check the design and use the same vendor for related devices; single vendor dependence → keep an alternative supplier.

5.5 Good Practices and Common Mistakes

Good Practices	Common Mistakes
Get requirements and design approved before buying	Buying equipment first and finding uses later
Include growth (3–5 years) and spare capacity	Buying exactly for today's users
Compare at least three quotations; use scoring	Choosing only the cheapest price or a favourite brand
Ask for warranty, local support and SLA in writing	Ignoring maintenance, licence renewal and support costs
Test and document before final payment	Accepting delivery without checking items
Keep records: asset register, contracts, invoices	No documentation, so later audit and upgrade are difficult

Key Takeaways — Unit V

- ✓ A procurement plan states what to buy, quantity, specification, cost, vendor and schedule for the network project.
- ✓ Steps: requirements → design and BOM → specifications → cost/TCO → RFQ/RFP/tender → vendor evaluation → contract, delivery, testing, payment.
- ✓ Specifications should be measurable and vendor-neutral; include growth, spares and standards.
- ✓ Consider Total Cost of Ownership, not only purchase price; add contingency and check VAT/duties.
- ✓ RFI (information), RFQ (price), RFP (proposal), Tender (formal bid), PO (order).
- ✓ Use a weighted scoring matrix for fair vendor selection; include warranty, SLA and local support.
- ✓ Test equipment (acceptance test), record it in the asset register and hand over documentation before final payment.

— End of Unit 5 —