Statement of Work

1. **Introduction**
   This project involves the development of a Bandwidth Monitoring System that tracks network usage in real-time, providing detailed insights into bytes sent/received, device and application-level bandwidth consumption, and alerts for high usage. The system includes a web-based dashboard for visualization and analysis, making it ideal for network administrators and IT teams.

2. **Objectives:**

- Develop a real-time bandwidth monitoring tool to track network usage.
- Provide granular insights into device and application-level bandwidth consumption.
- Generate alerts for abnormal usage (e.g., exceeding 100 MB thresholds).
- Offer historical data visualization for trend analysis.
- Ensure cross-platform compatibility (Windows, Linux, etc.).
- Maintain data security and privacy.

3. **Scope of Work:**
   The project includes the following phases and tasks:

Phase 1: Research & Planning

- Define system architecture and requirements.
- Identify key metrics (bytes sent/received, top devices/applications).
- Select technologies (Flask, SQLite, psutil, Chart.js).

Phase 2: Design & Prototyping

- Design the database schema (bandwidth, devices, applications, alerts).
- Develop a prototype dashboard with real-time metrics.
- Implement data collection logic (network interfaces, processes).

Phase 3: Development & Testing

- **Frontend**: Build interactive charts (usage trends, device/app breakdowns).
- **Backend**:
  - Develop APIs for data retrieval (/api/current_usage, /api/historical).
  - Implement alerting logic (threshold checks).
- **Database**: Optimize queries and indexing.
- **Testing**: Validate accuracy of metrics and alerts.

Phase 4: Review & Deployment

- Deploy the system with automated monitoring threads.
- Document setup, usage, and maintenance.
- Conduct user training (if applicable).

4. **Deliverables:**

   Functional Bandwidth Monitoring System with:
   - Real-time dashboard (dashboard.html).
   - Backend APIs (app.py).
   - SQLite database (bandwidth.db).

   Documentation:
   - Setup guide (requirements: Flask, psutil, matplotlib).

   Alerting System: on screen

5. Timeline:

- **Project Onset: 8th Feb**
- **Phase 1: Research & Planning** (2 Weeks) 9th Feb –23rd Feb,2025.
- **Phase 2: Design & Prototyping** (4 Weeks) 24th Feb – 24th March,2025.
- **Phase 3: Development & Testing** (6 Weeks) 25th March – 6th May,2025.
- **Phase 4: Review & Final Approval** (2 Weeks) 7th May – 21th May,2025.

6. **Responsibilities:**

- **Client Responsibilities:** Provide requirements, review progress, and approve milestones.
- **Development Team Responsibilities:** Design, develop, test, and deploy the web application.
- **Research Team Responsibilities:** Implement and validate predictive models.

7. Assumptions & Constraints:

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- **Assumptions:**
  - System runs on machines with Python 3.7+.
  - Admin has access to network interfaces/processes.
- **Constraints:**
  - Limited to single-node monitoring (no distributed tracking).
  - Alerts are UI-only (no SMS/email by default).

8. Acceptance Criteria:

The system will be approved if it:

1. Accurately logs and displays real-time bandwidth usage.
2. Generates alerts when usage exceeds 100 MB.
3. Provides historical data visualization (1h/24h/7d).
4. Handles at least 100 devices/applications without performance issues.

9. Roles:

Member	Role	Responsibilities
V. Nithin Reddy (SE22UCSE278)	Project Lead	Overall coordination, timeline management, and integration
M. Panvi Tej (SE22UCSE194)	Backend Developer	Flask API development, database design, and data processing
N. Kushwanth Reddy (SE22UCSE177)	Frontend Developer	Dashboard UI/UX, Chart.js integration, and responsive design
C. Aryan (SE22UCSE035)	Network Specialist	psutil implementation, device/application tracking logic
A. Hemanth (SE22UCSE109)	QA Engineer	Test planning, bug tracking, and validation
B. Jathin Reddy (SE22UCSE118)	Documentation Lead	Technical documentation and user guides

E. Anvith Tej (SE22UCSE089)	DevOps	Deployment, performance optimization, and monitoring

10. Signatures:

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Name: M. Panvi Tej Id: SE22UCSE194,

Name: C. Aryan Id: SE22UCSE035,

Name: B. Jathin Id: SE22UCSE118,

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Date: 4th Feb.