# Phase 1: HP NonStop Fundamentals

**Goals:** Build foundational understanding of HP NonStop architecture, OS, and basic development.

## Topics

1. **HP NonStop Overview**
    - Architecture and fault tolerance design.
    - Transaction processing principles.
    - Use cases in banking, telecom, and payments.
2. **Guardian OS**
    - File system concepts.
    - Processes and interprocess communication.
    - Process pairs and fault tolerance.
3. **TACL (Transaction Application Control Language)**
    - Scripting basics.
    - File and process management.
    - Command automation.
4. **Pathway Environment**
    - Understanding Pathmon, servers, and requesters.
    - Message-based communication.
    - Deploying a simple Pathway application.
5. **Programming Basics**
    - Writing and compiling simple programs in **C**, **COBOL**, and **TAL**.

- Understanding the NonStop development toolchain.

### Activities

- Weekly labs (create and manage processes, write TACL scripts).
- Mini-project: Develop a “Hello Pathway” application in COBOL or C.
- Weekly quizzes and recap sessions.

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## Phase 2: Advanced HP NonStop & Payment Switching

**Goals:** Deepen knowledge in data, security, and financial transaction processing.

### Topics

1. **Database Management**
    - Enscribe: record-based file system and applications.
    - SQL/MP: schema definition, DDL/DML, joins, and transactions.
    - Comparison with SQL/MX (if relevant for roadmap).
2. **Application Development**
    - Transaction integrity (ACID).
    - Error handling and recovery techniques.
    - Interfacing NonStop with external systems (basic APIs, sockets).
3. **Security & Compliance**
    - User access control, auditing, and role separation.
    - Security hardening best practices.
    - Compliance requirements (PCI DSS for payment systems).

4. **Payment Switching Concepts**
    - Card/payment message flows (ISO 8583 basics).
    - Switch architecture on HP NonStop.
    - Real-time processing considerations.

### Activities

- Lab exercises on SQL/MP queries and Enscribe data access.
- Group assignment: simulate a small database-backed application with Enscribe and SQL/MP.
- Security hardening workshop with use cases from the financial industry.

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## Phase 3: Hands-On Project & Certification

**Goals:** Apply knowledge in a capstone project simulating a payment switch; prepare for assessment.

### Project: Payment/Card Transaction Switch Simulation

- **Environment Setup:** Configure Pathway with multiple server classes.
- **Core Logic:** Implement ISO 8583-like transaction flow (authorization request → database lookup → response).
- **Database Integration:** Use Enscribe/SQL/MP for account and transaction data.
- **Fault Tolerance:** Show recovery with process pairs.
- **Monitoring & Logging:** Capture transaction logs for auditing.

### Additional Skills

- Debugging real-time workloads (use tools like Inspect, Peruse).

- Performance tuning and optimization techniques.
- Troubleshooting transaction bottlenecks.

## Assessment

- Written/online test (conceptual + problem solving).
- Practical test (hands-on exercises).
- Final project presentation and demo.
- Certification of completion.

✅ **Outcome:** By the end, junior developers will be able to:

- Understand and operate in Guardian OS/TACL/Pathway.
- Write and deploy programs in COBOL, C, TAL on NonStop.
- Build and manage Enscribe/SQL/MP databases.
- Apply security and compliance in financial systems.
- Implement and troubleshoot a simplified payment switch.