

**Advanced Transportation Controller (ATC)  
Application Program Interface (API) Standard  
Expedited Project Review**

**12 December 2002**

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# API Expedited Project Review

**Why do we need an API?**

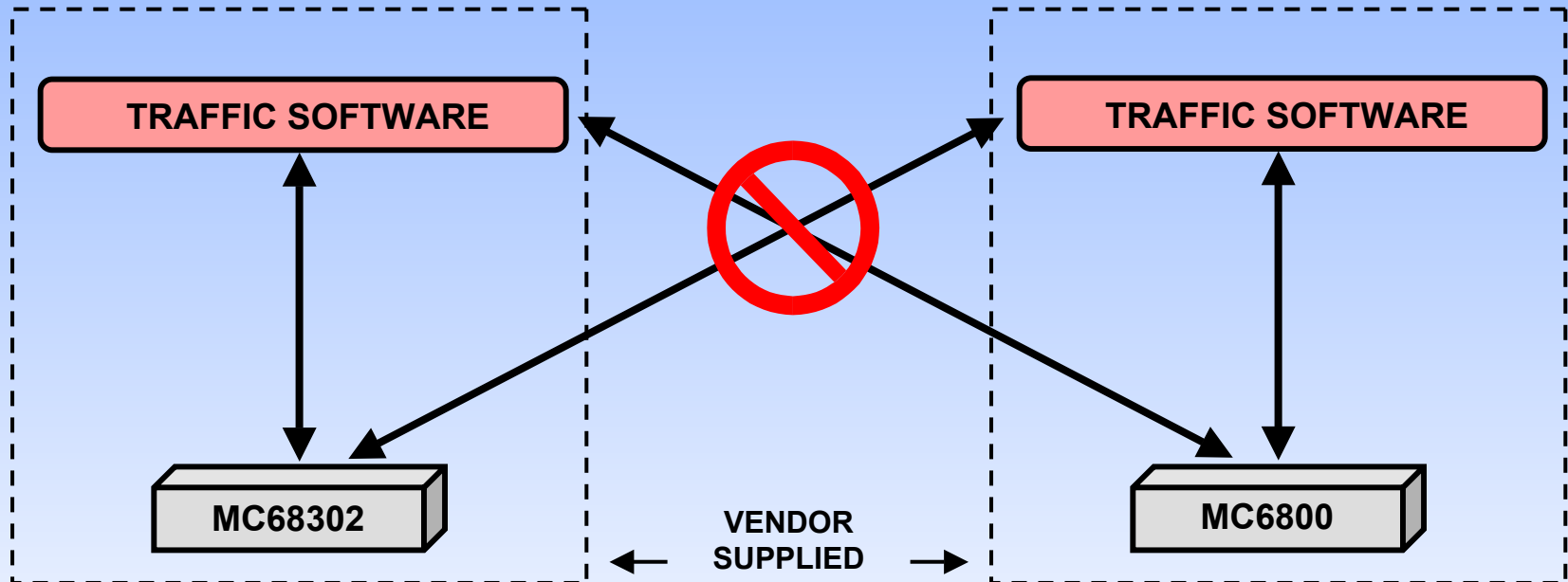
**How does the API work?**

**API Proof-of-Concept Evaluation**

**Draft API Project Plan**

# Why do we need an API?

- Historically, application software has not been portable across controller manufacturers



## Why do we need an API?

- **Closed systems make it nearly impossible for non-manufacturers to create controller applications for our industry**
- **Real-time operating systems (RTOSs) are required to effectively take advantage of new technologies**
- **There is not uniformity between RTOSs**

## Why do we need an API?

- **We do not want to be restricted to one RTOS**
- **Open hardware architectures are not enough to accomplish the priorities set forth by the ATC Joint Committee**

# API Expedited Project Review

**Why do we need an API?**

**How does the API work?**

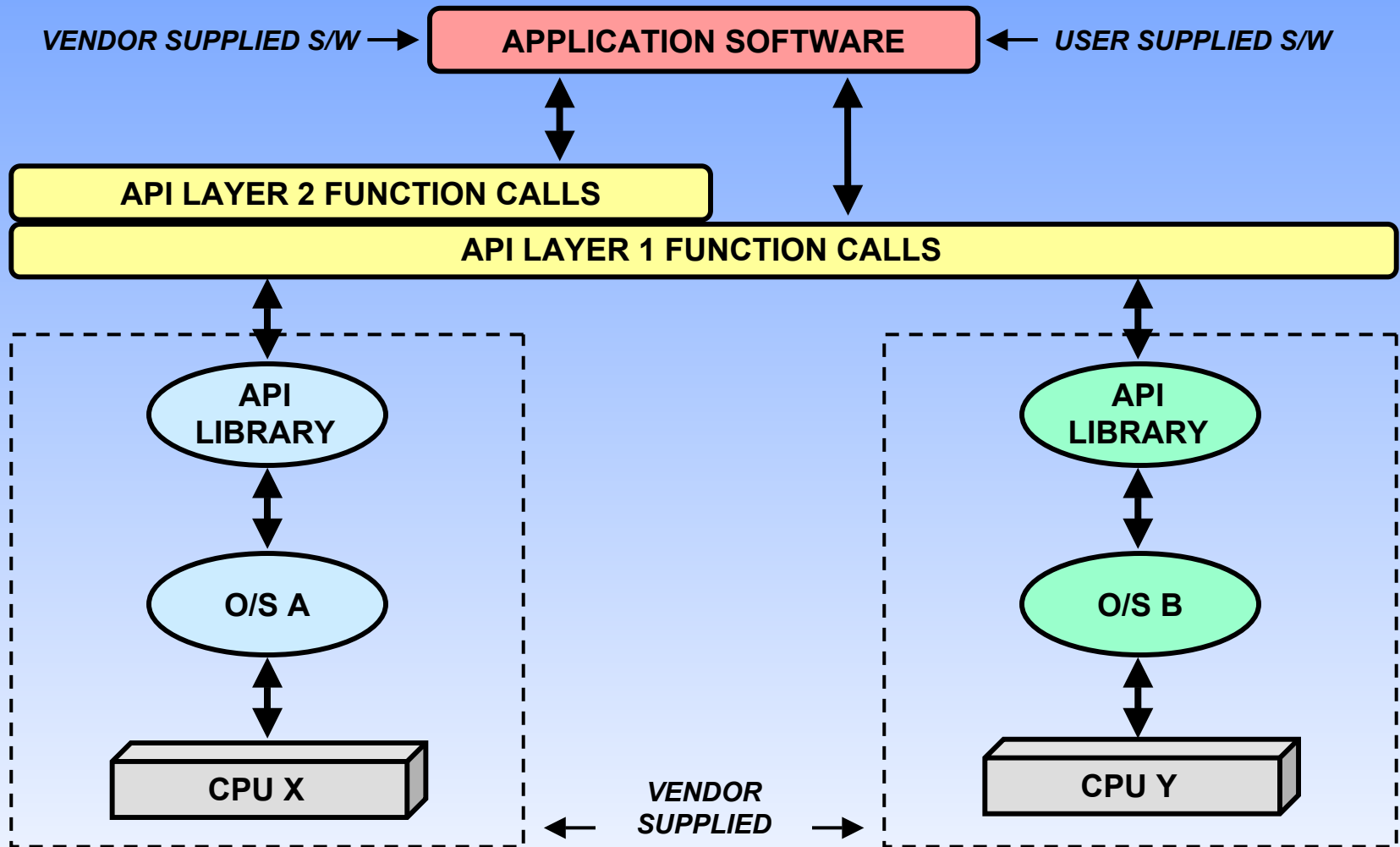
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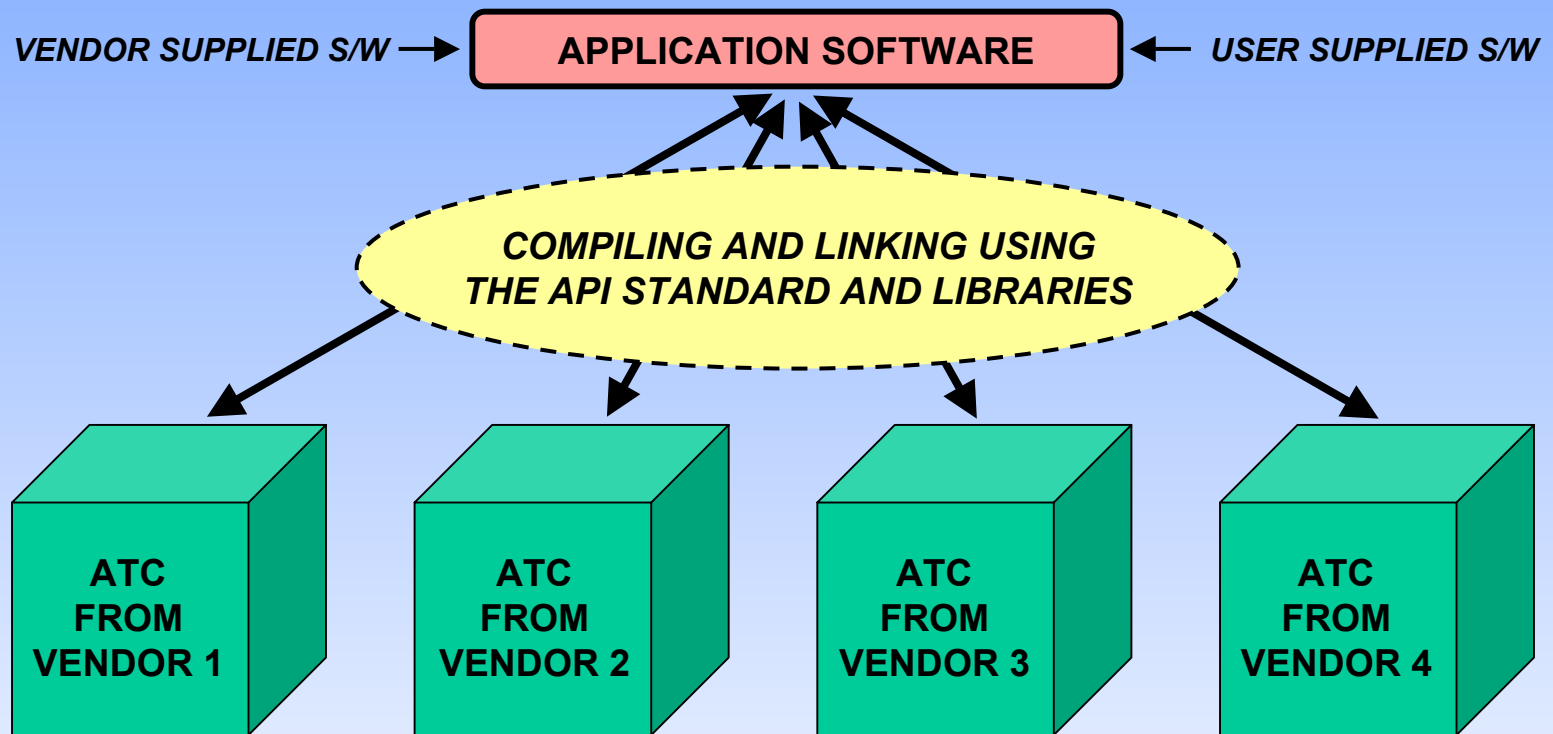
## How does the API work?

- **The API Standard is a source code level interface defined by “C” function descriptions and “header” information**
- **Manufacturers provide an API library that supports the API Standard and is compatible with their controller hardware and RTOS**
- **Software developers compile and link their application with the appropriate API library for the target controller**

# How does the API work?



# How does the API work?



## How does the API work?

- Not a communication protocol but a software abstraction architecture that makes portability easier
  - O/S separates application software from the hardware
  - API separates the application from the O/S
- Contributes to all of the ATC priorities set forth by the ATC Joint Committee

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## API Proof-of-Concept Evaluation

- **The current API Standard Working Group Draft was “frozen” in September 1999 in order to seek funding for a proof-of-concept evaluation project**
- **The purpose of this project is to mitigate changes to the API Standard once it is adopted**
- **An RFP was distributed in August 2002**

# API Proof-of-Concept Evaluation

- **The API Proof-of-Concept Evaluation project was signed off with an engineering contractor December 2002**

# API Proof-of-Concept Evaluation

## Goals of the project:

- 1) Evaluate the portability of the proposed API Standard
- 2) Evaluate the completeness and consistency of the API Standard

# API Proof-of-Concept Evaluation

## Goals of the project (cont.):

- 3) Develop an evaluation plan and software suite for measuring the performance of API libraries
- 4) Recommend modifications and enhancements to the API Standard

# API Proof-of-Concept Evaluation

## 4 Phases to the project:

- **Start-Up / Initiation Phase**
- **Phase 1 – Paper Study & Benchmark Design**
- **Phase 2 – Working Group Review**
- **Phase 3 – Benchmark Implementation & Testing**

# API Proof-of-Concept Evaluation

## Start-Up / Initiation Phase

- **Deliverables**
  - **Project Schedule**
  - **Budget**
  - **Work Plan**
  - **Resource Loaded Network**
- **Coordination Issues**
  - **Site visit and initial meeting with James Cheeks and Ralph Boaz**

# API Proof-of-Concept Evaluation

## Phase 1 – Paper Study & Benchmark Design

- **Deliverables – Written & Presented**
  - Analysis of the entire API Standard
  - Detailed test plan
  - Benchmark designs
  - Recommendations for modification
  - Revised project plan
- **Coordination Issues**
  - Working Group meeting/design review

# API Proof-of-Concept Evaluation

## Phase 2 – Working Group Review

- **Deliverables**
  - **Working Group direction to the contractor for Phase 3**
- **Coordination Issues**
  - **Review of the Phase 1 deliverables by Working Group**
  - **Meeting to approve Phase 3 plan**

# API Proof-of-Concept Evaluation

## Phase 3 – Benchmark Implementation & Testing

- **Deliverables– Written & Presented**
  - **Software benchmark suite**
  - **Results of the testing**
  - **Preliminary report**
  - **Final report with recommended changes**
- **Coordination Issues**
  - **Working Group review preliminary**
  - **Working Group meeting/final review**

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# Draft API Project Plan

