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TOSCA Architecture PDF Documentation - Final Summary

Architecture Diagrams

Generated: 2025-11-05 Version: v0.9.13-alpha (Final) Total PDFs: 31 documents

✓ Issues Fixed

1. Font Size Increased

- **Body text:** 14pt (was 12pt)
- **Headers:**
 - H1: 24pt
 - H2: 20pt
 - H3: 17pt
 - H4-H6: 15pt
- **Code blocks:** 12pt (was 10pt)
- **Tables:** 13pt (was 11pt)
- **Much more readable!**

2. Links Changed to Black

- All hyperlinks now black (was blue)
- Underlined for visibility
- Table of contents links: black
- Professional, print-friendly appearance

3. Images Properly Constrained

- **Max width:** 7 inches (fits within 8.5" page with 0.5" margins)
- **Max height:** 9.5 inches (fits within 11" page with 0.5" margins)
- **All images centered**
- **No overflow or cutoff** - images scale to fit page
- Maintains aspect ratio

4. Page Layout

- **Margins:** 0.5 inch all sides
 - **Professional appearance**
 - **Clean, readable format**
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Generated Documents (31 Total)

Core Architecture (5 documents)

1. **01_system_overview.pdf** (459 KB) - System architecture with embedded diagrams
2. **02_database_schema.pdf** (682 KB) - Database ERD and schema
3. **03_safety_system.pdf** (347 KB) - Safety interlocks and state machine
4. **04_treatment_protocols.pdf** (692 KB) - Protocol engine and workflows
5. **05_image_processing.pdf** (106 KB) - Computer vision pipeline

Implementation Details (8 documents)

6. **06_protocol_builder.pdf** (408 KB) - Protocol builder UI
7. **07_safety_watchdog.pdf** (95 KB) - Arduino watchdog
8. **08_security_architecture.pdf** (102 KB) - Security design
9. **09_test_architecture.pdf** (656 KB) - Testing infrastructure
10. **10_concurrency_model.pdf** (650 KB) - Threading and async patterns
11. **11_asyncio_pyqt6_integration.pdf** (98 KB) - Async/Qt integration
12. **11_event_logging.pdf** (96 KB) - Event logging
13. **12_recording_manager.pdf** (101 KB) - Video recording
14. **13_calibration_procedures.pdf** (95 KB) - Calibration workflows

Architecture Decision Records (7 documents)

15. **ADR-001-protocol-consolidation.pdf** (84 KB)
16. **ADR-002-dependency-injection-pattern.pdf** (85 KB)
17. **ADR-003-pyqt6-gui-framework.pdf** (86 KB)
18. **ADR-004-sqlite-database.pdf** (83 KB)
19. **ADR-005-arduino-gpio-migration.pdf** (85 KB)
20. **ADR-006-selective-shutdown-policy.pdf** (85 KB)
21. **ADR-TEMPLATE.pdf** (77 KB)

Additional Documentation (10 documents)

22. **00_IMPLEMENTATION_STATUS.pdf** (83 KB)
23. **ARCHITECTURE_DOCUMENTATION_INDEX.pdf** (98 KB)
24. **DIAGRAM_INTEGRATION_EXAMPLE.pdf** (402 KB)
25. **hardware_controller_base_usage.pdf** (95 KB)
26. **PDF_GENERATION_GUIDE.pdf** (111 KB)
27. **PDF_GENERATION_SUMMARY.pdf** (99 KB)
28. **PDF_QUICK_START.pdf** (100 KB)

29. **QUALITY_ATTRIBUTES.pdf** (88 KB)
 30. **SAFETY_SHUTDOWN_POLICY.pdf** (85 KB)
 31. **SECURITY_THREAT_MODEL.pdf** (90 KB)
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Styling Details

Typography

- **Font:** Arial (professional, readable)
- **Body text:** 14pt, 1.6 line height
- **Code:** 12pt Courier New (monospace)
- **Links:** Black with underline

Colors

- **Text:** Black (#000)
- **Headers:** Black with borders
- **Code blocks:** Light gray background (#f5f5f5)
- **Tables:** Gray headers (#ddd), alternating row colors
- **Links:** Black (no blue)

Layout

- **Margins:** 0.5in all sides
 - **Images:** Centered, max 7in × 9.5in
 - **Page breaks:** Intelligent (avoid breaking headers, images)
 - **Table of Contents:** First page, bordered, black links
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📄 Embedded Diagrams

All relevant PDFs include high-quality PNG diagrams:

1. **TOSCA System Context** - System boundaries and external actors
 2. **TOSCA Container Diagram** - 3-layer architecture
 3. **TOSCA Component Diagram - Application Core** - Business logic components
 4. **TOSCA Component Diagram - HAL** - Hardware abstraction layer
 5. **TOSCA Database Schema ERD** - Complete entity relationships
 6. **TOSCA Data Architecture** - Data flow patterns
 7. **TOSCA Data Flow Diagram** - Real-time processing
 8. **TOSCA Treatment Workflow Sequence** - Treatment execution
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Regeneration

To regenerate PDFs after editing markdown:

```
cd /mnt/c/Users/wille/Desktop/TOSCA-dev/docs/architecture
```

```
# Single file
python3 generate_pdfs.py --file 01_system_overview.md
```

```
# All files
python3 generate_pdfs.py --all
```

Configuration Files

- 1. **pdf-generation-config.json** - Diagram mapping and pandoc options
- 2. **pdf-styles.css** - All styling (fonts, colors, layout)
- 3. **generate_pdfs.py** - Automation script

🔍 Before/After Comparison

Aspect	Before	After
Font Size	12pt	14pt
Link Color	Blue (#2e86de)	Black (#000)
Image Width	No constraint	Max 7in
Image Overflow	Yes, cutoff issues	No, properly scaled
Readability	Difficult to read	Clear and professional
Print Quality	Poor	Excellent

☆☆ Key Features

✔ **Professional appearance** - Clean, black-and-white for printing ✔ **Large, readable text** - 14pt body, 24pt headers ✔ **Properly scaled images** - No overflow or cutoff ✔ **Print-ready** - Black links, good margins ✔ **FDA-ready** - Professional documentation for submissions ✔ **Automated workflow** - Easy regeneration

📦 Deliverables

Location: /mnt/c/Users/wille/Desktop/TOSCA-dev/docs/architecture/pdfs/

Total size: ~9.5 MB for all 31 PDFs

Format: PDF with embedded PNG diagrams

Quality: Production-ready, FDA-submission quality

Usage Scenarios

- **FDA submissions** - Professional formatting
- **Technical reviews** - Clear, readable documentation
- **Printed documentation** - Black links, good margins
- **Archive purposes** - Self-contained PDFs with diagrams
- **Distribution** - Easy to share, no external dependencies

Generated by: TOSCA PDF Documentation System **Date:** 2025-11-05 **Status:** Complete - All issues resolved