



EARLY 2000S | ORIGINAL PROOF OF CONCEPT C. 2002-2003

IRIS: Building an Early Connected Public-Safety Platform

Real-time chemical-plume GIS, mobile field computing, wireless infrastructure and incident operations

In the early 2000s - before smartphones, app stores, cloud GIS and modern mobile broadband - first responders supporting the Umatilla-area Chemical Stockpile Emergency Preparedness Program (CSEPP) still relied primarily on radio, phone calls and basic text. IRIS was a suite of integrated software and hardware, not a single application. Its original proof of concept moved the current chemical-plume GIS layer itself to responders, field laptops and emergency operations centers.

MY ROLE

While still completing a Computer Science degree, I served as the overall solution architect and primary developer/integrator for the original IRIS proof of concept and plume-to-field capability. I defined the end-to-end architecture, directed required adaptations by the D2-Puff and SoloField product teams, developed the Java integration server and connecting components, and proved the concept over Nextel mobile data before the regional Wi-Fi environment existed.

PROJECT AT A GLANCE

c. 2002-03

ORIGINAL PROOF OF CONCEPT

450+

400 LAPTOPS + 50+ RUGGED HANDHELDS

2 YEARS

PRIMARY OPERATIONAL SUPPORT OWNER

CSEPP | HERMISTON-UMATILLA, OREGON

Multi-year expansion and operations through 2010

IRIS WAS A SUITE - NOT A SINGLE APPLICATION

Plume-to-field GIS

OPS Console

Regional Wi-Fi

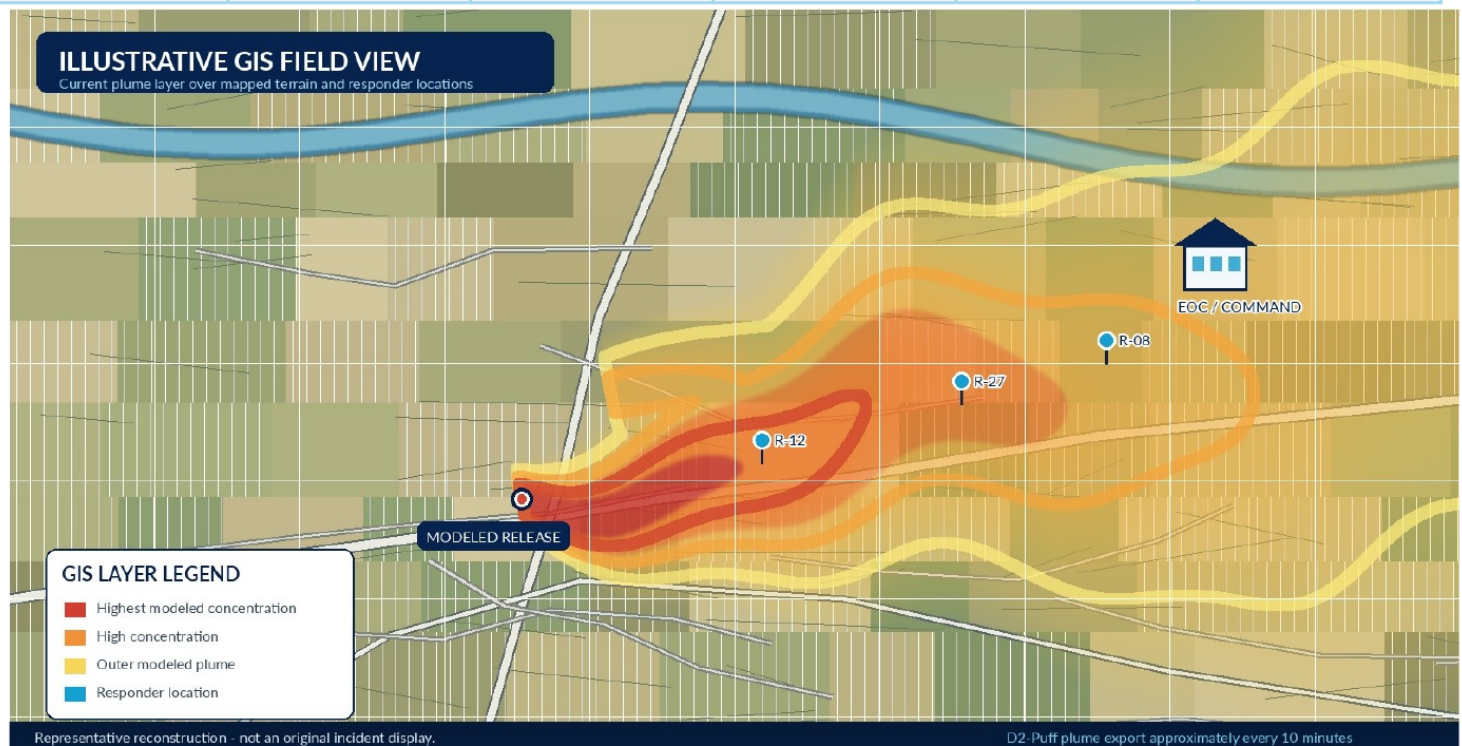
MW + fiber backhaul

Cameras + video

Field + EOC systems

ILLUSTRATIVE GIS FIELD VIEW

Current plume layer over mapped terrain and responder locations



Representative reconstruction - not an original incident display.

D2-Puff plume export approximately every 10 minutes

UNPRECEDENTED FOR FIELD OPERATIONS

The responder did not receive a phone call describing the plume. The responder retrieved the actual current GIS layer and saw it against mapped terrain and location data.

INDEPENDENTLY DOCUMENTED

Government and technology publications covered IRIS and the regional deployment contemporaneously. The original coverage remains online; direct links are on Page 5.

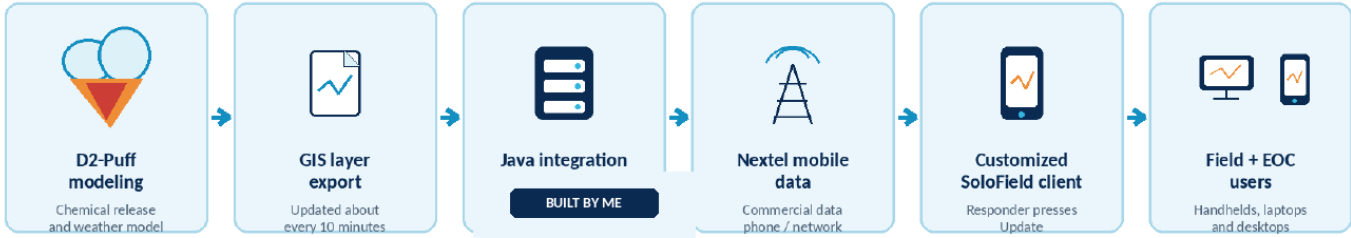


1 | ORIGINAL IRIS PROOF OF CONCEPT

How IRIS moved live GIS data from the lab to the field

The proof of concept existed before the regional Wi-Fi network. It used commercial Nextel mobile data, a standalone Java server, and a customized mobile GIS workflow to prove that current plume information could reach responders wherever they were operating.

END-TO-END PLUME-TO-FIELD ARCHITECTURE



On demand, the client retrieved the newest export and replaced the active plume layer.

WHAT I OWNED

- Overall architecture: defined the complete data flow from modeling output to responder use.
- Requirements and direction: specified the product changes needed from D2-Puff and SoloField.
- Development: wrote the Java server and the connecting client/server integration components.
- Field proof: demonstrated the concept over Nextel before the regional Wi-Fi system existed.
- Multi-platform delivery: replicated the capability on rugged handhelds, field laptops and Windows desktops at area emergency centers.

COLLABORATIVE PRODUCT CONTRIBUTIONS

- D2-Puff developers added the GIS-layer export capability under my requirements and technical direction.
- SoloField developers adapted the mobile GIS client and update behavior under my requirements and technical direction.
- Emergency-management and responder stakeholders supplied operational needs, exercise participation and user feedback.
- The larger implementation team later contributed network sites, installation, administration and infrastructure expansion.

WHY THIS WAS SO EARLY

In 2002-2003, field communications still centered on radio, phone calls and basic text. IRIS moved the current, location-aware GIS layer itself to responders.



ENGINEERING CONSTRAINTS I HAD TO SOLVE

SLOW MOBILE DATA Designed the update cycle around early Nextel bandwidth and coverage limitations.	LIMITED RUGGED HARDWARE Worked within severe memory, processing, display and storage constraints.	EARLY MOBILE GIS Adapted a specialized GIS client before modern mobile mapping platforms existed.	MULTI-VENDOR INTEGRATION Made modeling, GIS, server, carrier and field-device components operate as one workflow.
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2 | OPS CONSOLE - A SEPARATE CREATION WITHIN IRIS

OPS Console: a distinct software product that became part of the IRIS suite

IRIS was a suite of software and hardware technologies. OPS Console was a distinct web-based product within that suite, separate from the regional communications and video infrastructure. I conceived, designed, developed and completed it, then integrated it into the broader IRIS operating environment.

MY ACHIEVEMENT

I conceived the product and operational workflow, designed the application and data model, led development, and personally completed OPS Console as an ASP.NET application with a Microsoft SQL Server backend. Another developer worked under my direction for part of the effort.

- Product ownership: defined responder, team, incident, triage and patient-tracking workflows.
- Technical ownership: designed the application and database-backed operating model.
- Development leadership: directed another developer, then resumed direct development and finished the system personally.

ASP.NET

WEB APPLICATION

SQL SERVER

DATABASE BACKEND

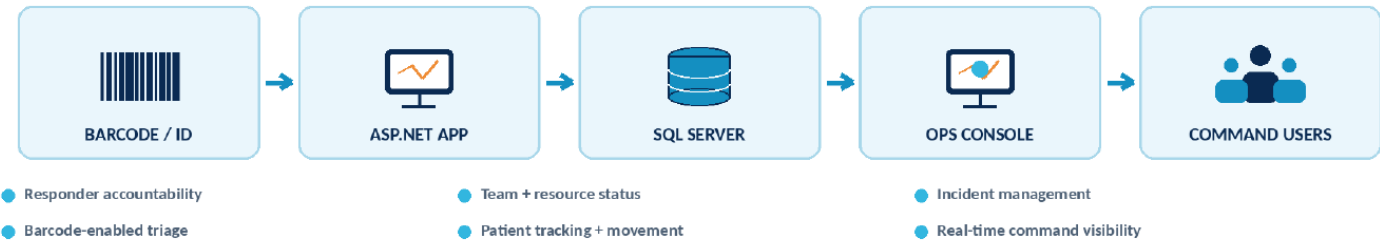
BUILT BY ME

CONCEPT, DESIGN, DEVELOPMENT

PART OF IRIS

SEPARATE PRODUCT WITHIN THE SUITE

OPS CONSOLE OPERATIONAL WORKFLOW



RESPONDER ACCOUNTABILITY Automatic or barcode-assisted registration and arrival status.	TEAM + RESOURCE STATUS Available personnel, teams and operational resources.	INCIDENT MANAGEMENT Shared incident status and command visibility.
BARCODE-ENABLED TRIAGE Coded patient identification and field workflow support.	PATIENT TRACKING Patient movement and destination visibility.	COMMAND VISIBILITY Current operational information for EOCs and medical personnel.

OPERATIONAL READINESS

OPS Console was used in formal exercises, tested extensively, and ready for activation during a real chemical incident. Fortunately, that incident never occurred.

TRAINING + ADOPTION

I created the IRIS training program and personally trained all participating first responders on use of the complete IRIS suite - not only plume viewing or handheld operation, but the full field, desktop and operational workflow.

WHY OPS CONSOLE MATTERED

OPS Console extended IRIS beyond plume awareness into responder accountability, resource status, incident coordination, barcode-enabled triage, patient movement and real-time command visibility.



3 | REGIONAL WI-FI, MICROWAVE/FIBER BACKHAUL AND DIGITAL VIDEO

Building the regional communications and video environment

Federal expansion turned the proven concept into a rural, multi-community public-safety environment. Town-centered Wi-Fi networks were backhauled by microwave into fiber, and the digital cameras used the same regional backbone. The infrastructure was a team effort; my role crossed major technical project leadership, systems integration, technical coordination, hands-on troubleshooting and operational support.

450+

400 LAPTOPS + 50+ RUGGED HANDHELDS

30

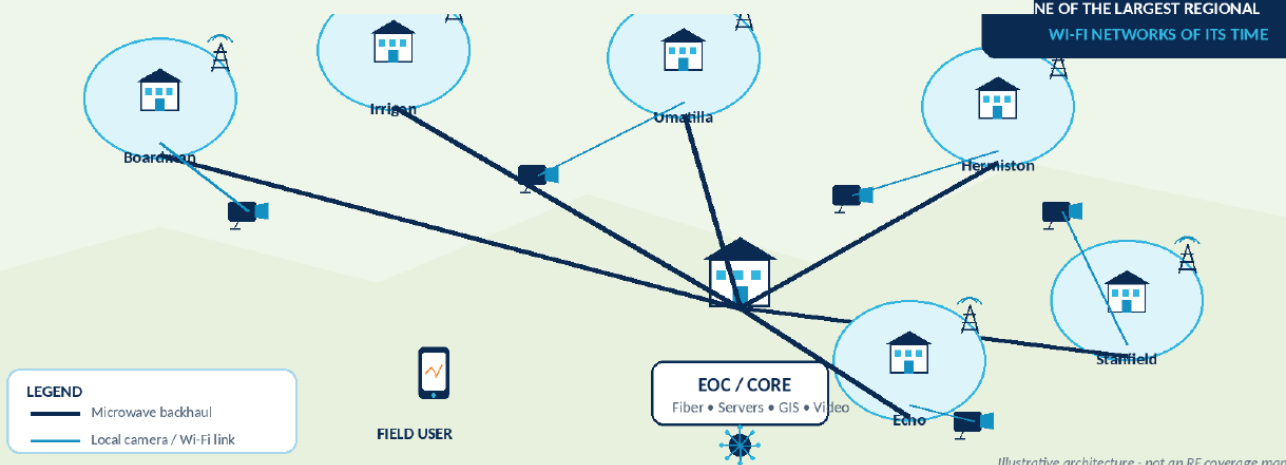
NETWORKED CAMERAS REPORTED [4]

3

COMMAND CENTERS REPORTED [4]

REGIONAL COMMUNICATIONS + VIDEO BACKBONE

Town-centered Wi-Fi networks | microwave backhaul | fiber core | cameras on the same backbone

ONE OF THE LARGEST REGIONAL
WI-FI NETWORKS OF ITS TIME

MY ROLE IN THE INFRASTRUCTURE BUILDOUT

TECHNICAL PROJECT LEADERSHIP

Held major project responsibility across the multi-year expansion, agencies, vendors and contributors.

SYSTEMS INTEGRATION

Connected wireless links, microwave/fiber backhaul, servers, GIS, cameras, applications, devices and emergency centers.

TECHNICAL COORDINATION

Translated operational needs into assignments and decisions across product and infrastructure teams.

HANDS-ON TROUBLESHOOTING

Personally diagnosed failures across network, server, application, device and field boundaries.

FIELD + DEPLOYMENT SUPPORT

Supported sites, connectivity, field devices and agency users through rollout and exercises.

CAMERA + VIDEO RESPONSIBILITY

Operated the digital-camera server and prepared targeted incident video for law-enforcement users.

DIGITAL VIDEO OPERATIONS



TEAM DELIVERY CONTEXT

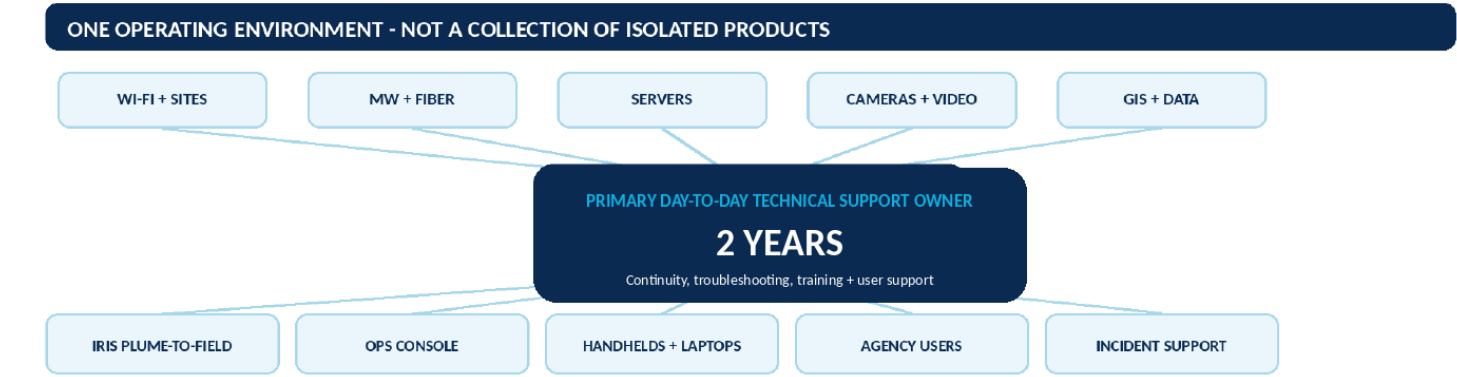
The broader infrastructure was collaborative. Other contributors performed physical site construction, network installation, backend administration, system administration and other technical and operational work. My role crossed project leadership, systems integration, technical coordination and direct troubleshooting.



4 | OPERATIONAL OWNERSHIP, SIGNIFICANCE AND INDEPENDENT COVERAGE

From deployment and adoption to end-to-end operational ownership

After the major buildout, I became the primary - effectively sole - day-to-day technical support resource for the mature integrated environment for 2 years. The responsibility crossed the complete technology stack rather than one application or one vendor product.



THE COMPLETE STORY

I architected and proved the original IRIS plume-to-field solution, created OPS Console, built the IRIS training program and trained all participating first responders, helped technically deliver the funded Wi-Fi, microwave/fiber and digital-video expansion, and then kept the mature multi-agency environment operating.

ARCHITECTURE + SOFTWARE	TRAINING + ADOPTION	PROGRAM DELIVERY + INTEGRATION	TROUBLESHOOTING + OWNERSHIP
Defined the original IRIS operating model; built the Java server and ASP.NET / SQL Server OPS Console.	Created the complete IRIS training program and personally trained all participating first responders.	Coordinated agencies, vendors and contributors while connecting modeling, GIS, networks, video, devices and users.	Diagnosed cross-boundary failures and supported continuity across the mature environment for 2 years.

WHY IT MATTERED: Before smartphones, 4G/5G and cloud GIS, IRIS moved the current GIS layer from a specialized model into responders' hands.

INDEPENDENT CONTEMPORARY COVERAGE

IRIS and the broader regional public-safety system were documented at the time by government sources, national trade publications and technology media. The original coverage remains publicly accessible today.

1 SECURITY MAGAZINE 2004 Emergency Responders Rely on Handhelds IRIS handhelds, live plume maps, barcode wristbands and field reporting. OPEN ORIGINAL COVERAGE	2 U.S. DOJ / OJP / NCJRS 2005 Hermiston Puts Mobile Computing to the Test 50+ Recon handhelds, plume overlays, field communications and regional Wi-Fi. OPEN ORIGINAL COVERAGE
3 NEXTGOV / FCW 2005 One Big Wireless Net Proxim, Nextel, SoloField GIS, digital video and federal expansion. OPEN ORIGINAL COVERAGE	4 GOVERNMENT TECHNOLOGY 2010 Oregon Protects Communities From Deadly Chemical Weapons D2-Puff, cameras, command centers, operations console and awards. OPEN ORIGINAL COVERAGE
5 WI-FI PLANET DEPLOYMENT ERA Wireless Watches the Gas Rural multi-town network, early launch and Proxim infrastructure. OPEN ORIGINAL COVERAGE	6 MICROSOFT / TDS 2003 Windows Mobile 2003 Launch Partner Historical context for the newly released rugged mobile platform. OPEN ORIGINAL COVERAGE

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