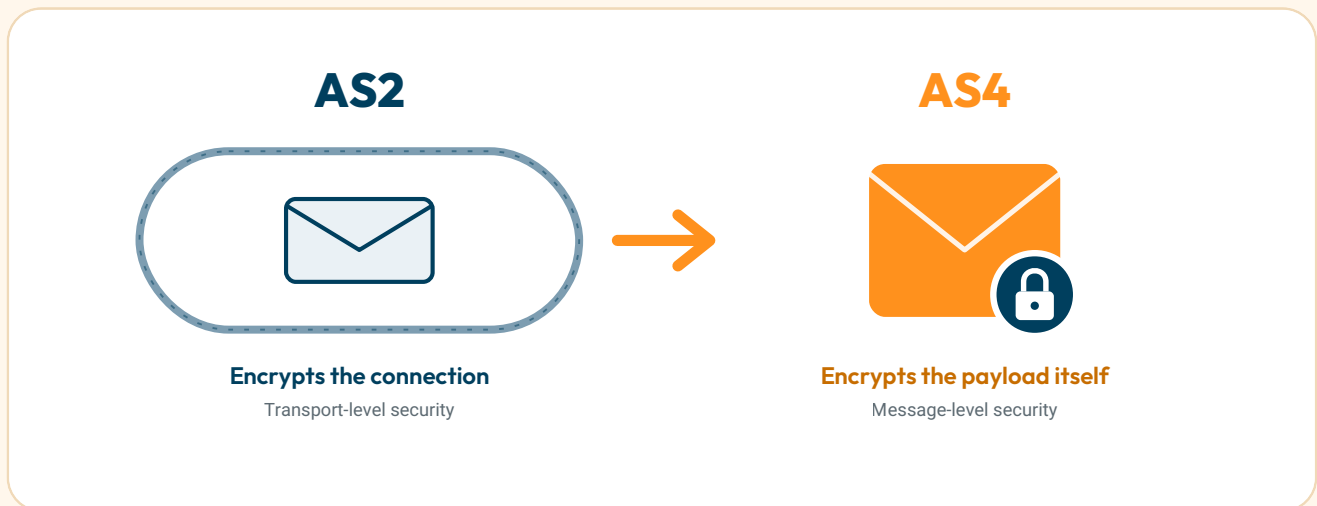


PROTOCOL MODERNIZATION GUIDE

AS4 Migration Guide

Upgrading Your EDI Environment from AS2

Security, partner readiness, and the seven pitfalls that derail AS4 upgrades. Consolidated from DivIHN's AS4 series.



2X

supply-chain attacks in 2025 vs.
the year before

7

pitfalls that derail most AS4
upgrades

<2 YRS

typical payback window after
migration

PROTOCOL MODERNIZATION GUIDE

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EXECUTIVE SUMMARY

What AS4 Changes, and Who Actually Needs It

Honest framing protects credibility more than an enthusiastic one.

AS2 is not broken, and this guide will not pretend otherwise.

AS2 remains the protocol most large North American retailers require by name, Walmart among them, and it will keep running reliably for organizations whose trading partner base stays there. AS4 is not a replacement for AS2 everywhere. It is the standard that the EU, pharma (through PGLN), energy (through ENTSO-E), and financial sectors have already adopted as their baseline, and the standard an increasing number of individual trading partners are starting to require on their own timeline.

AS2: North American retail

EU

Pharma (PGLN)

Energy (ENTSO-E)

Finance

This guide is for one specific reader: an EDI manager or integration lead sitting on an AS2 estate who now has a real driver in front of them, a partner mandate, a regulatory framework, or a compliance audit that surfaced a gap. If that driver does not exist yet, AS2 is still the right answer today. If it does exist, this guide walks through what actually changes, what breaks migrations, and what to do about it.

The chapters ahead follow the shape of the decision itself: why organizations move at all, what changes technically and operationally, how AS4 compares to the alternatives already in use, what AS4 delivers once it is running, the seven pitfalls that derail most upgrades, and the two operational disciplines, partner coordination and certificate management, that determine whether an upgrade stays stable after go-live.

1

WHY NOW • CHAPTER 1 OF 7

The Case for Moving Off Legacy EDI

Most teams do not evaluate their transport protocol until a failure, a partner, or an audit forces the question.

EDI runs quietly in the background of most organizations. Transactions flow, nobody asks questions, and the protocol underneath goes unexamined for years. That silence is starting to carry real cost. Supply-chain attacks doubled in 2025, compliance frameworks are tightening, and trading partners are moving to modern standards on their own schedule, whether a given supplier is ready or not.

Five risks building quietly inside a legacy stack

1**Security exposure that grows silently**

Legacy protocols like AS2 rely on encryption standards designed for an earlier threat landscape, without the message-level integrity, digital signatures, or non-repudiation modern frameworks expect. Every quarter of delay expands the attack surface a little further.

2**Compliance gaps that manual workarounds cannot close**

Regulatory bodies and major trading networks are moving toward AS4 and eDelivery as baseline standards for B2B exchange. Organizations still on legacy protocols face a widening gap that audit patches address only temporarily.

3**Partner onboarding that slows down revenue**

Weeks of manual configuration to onboard a single new trading partner burns IT hours and delays revenue at the same time. Partner ecosystems that modernize faster can deprioritize suppliers who cannot keep pace.

4**Operational costs hiding in plain sight**

Failed messages, manual reprocessing, and hours spent tracing errors through brittle legacy systems rarely show up as a line item, but they accumulate. A three-year cost comparison between maintaining legacy systems and migrating is often the number that moves the decision.

5**An architecture that cannot support what comes next**

Cloud migration, API-first strategies, and hybrid infrastructure are active initiatives at most organizations, not future roadmap items. Legacy EDI transports sit outside that architecture, and the friction compounds with every new integration.

Buying visibility software on top of AS2 is like installing smart meters on a leaking pipe.

The signals that say it is time to evaluate

Most businesses do not realize their EDI infrastructure is the bottleneck until a critical integration fails, a trading partner demands a new protocol, or an audit reveals a compliance gap. A few patterns tend to show up before that point, for a team paying attention:

A

Growing partner onboarding friction

If connecting a new trading partner takes weeks or requires manual intervention, the messaging layer is the bottleneck, not the business process around it.

B

Trading partners already on AS4

When partners in regulated industries such as pharma, energy, or finance start mandating AS4 compliance, the cost of inaction turns into a competitive liability rather than a technical footnote.

C

Rising maintenance cost with no clear return

When the IT team spends more time keeping legacy integrations alive than building new capability, that is technical debt accumulating, not stability.

BOTTOM LINE

The pressure to modernize is no longer coming from IT. It is coming from risk, compliance, partners, and the board, and it moves on their timeline, not the internal team's.

WHAT CHANGES • CHAPTER 2 OF 7

2

What You Need to Know Before Upgrading

The problem with a working EDI environment is that it hides risk instead of showing it.

A working EDI environment hides risk instead of showing it. Messages flow, partners stay connected, transactions complete, and that apparent stability is exactly why upgrades get delayed. The real risk surfaces under scale and pressure, not routine operations.

AS4 isn't a technical refresh. It's a shift in predictability, control, and transparency, a modern web-services standard built on XML and SOAP. It succeeds AS2 not because AS2 is broken, but because AS2 was never built for today's scale, security, or governance demands.

What AS4 changes at the message level

AS4 introduces message-level control, not just transport-level security. In practice, that means messages are delivered once and only once with explicit success or failure confirmation, data stays private and unaltered end to end at the message level rather than only in transit, both parties can conclusively prove message origin and receipt, and receipts and metadata create a built-in audit trail without extra tooling. Standardized profiles reduce partner-specific integration effort, and the architecture aligns natively with cloud, hybrid, and distributed enterprise environments.

Differentiator	AS2	AS4
Architecture model	Point-to-point file transfer	Web services-based messaging
Security approach	Transport-level security	Message-level security
Non-repudiation	Limited, implementation-dependent	Built in
Reliable delivery	Basic acknowledgements	Guaranteed delivery, reliable messaging
Duplicate handling	Limited and inconsistent	Explicit duplicate detection window
Receipt handling	Basic MDN acknowledgements	Multiple receipt types, clear delivery semantics
Scalability	Becomes complex as partners grow	Designed for large, distributed ecosystems
Auditability	Fragmented logging and tracking	Receipt-driven audit trail
Partner onboarding	Slower, custom-heavy	Faster, more predictable

AS2 vs. AS4: the operational differentiators that matter before a migration decision. Source: ANSI.

Why upgrades fail without a deliberate strategy

What's underestimated

AS4 introduces stricter requirements around security, reliability, and message handling than legacy EDI, and infrastructure setup and testing get harder to match. Most failures trace back to four things: mismanaged certificates, incomplete agreement on AS4 profiles, weak error handling, poor message tracking.

What's overlooked

Adoption slows for reasons beyond technology. Resistance to change and uneven partner readiness matter as much as any technical gap, since AS4 depends on coordination across partners, not just internal systems. Treat it as a simple protocol swap, and it exposes complexity instead of reducing it.

What leadership needs to decide

Risk posture

Is the current EDI environment defensible under rising message volumes, audits, and security scrutiny?

Timing

Modernize on your own terms, or wait until partners, regulators, or an incident force the change?

Control

Can legacy EDI provide the visibility, traceability, and accountability the business now expects?

Execution model

A governed, phased transition, or a rushed upgrade under pressure?

BOTTOM LINE

For most leadership teams, the real question is not whether AS4 makes sense. It is how exposed the current environment already is.

3

WHAT CHANGES • CHAPTER 3 OF 7

AS2, SFTP, VAN, and AS4 Compared

Four transmission models, and none of them is a universal answer.

Three transmission methods handle the overwhelming majority of EDI traffic today: AS2, SFTP, and VAN. Each solves the same basic problem, moving a file securely and reliably, with a different balance of cost, control, and complexity. AS4 is the fourth option now entering that decision, and it changes the comparison rather than simply extending it.

The three incumbents

AS2

Point-to-point, using digital certificates for encryption and authentication. Every successful transmission generates a signed receipt, which is why Walmart and most large retailers require it by name. **The burden:** an expired certificate on either side fails silently until documents stop arriving.

SFTP

Encrypted file transfer, no certificate exchange or acknowledgment framework. Faster to stand up, easier to maintain for smaller partner counts, common among mid-market suppliers. **The tradeoff:** weaker built-in confirmation, which is why some retailers won't accept it alone for compliance-critical documents.

VAN

An intermediary that routes documents between partners, removing the need to manage point-to-point connections, at the cost of a recurring transaction fee. Its protocol translation is often the real reason it survives even after most other partners move to direct connections.

Where does AS4 fit, and where it does not

Where AS4 fits

Built on web services, with WS-Security for end-to-end encryption and signing, native support for large payloads, and robust non-repudiation. It's the adopted standard in the EU, pharma (PGLN), energy (ENTSO-E), and finance, and it fits modern API and cloud platforms without a bridge.

Where it doesn't

North American retail. Walmart and most large US retailers still specify AS2 by name, and suppliers have little room to negotiate that. AS4 earns its place only where a real driver exists, a partner mandate, a regulatory framework, or a sector where it's already the baseline.

	AS2	SFTP	VAN	AS4
Setup cost	Higher, per partner	Low	Minimal	Higher, per partner
Ongoing cost	Near zero per transaction	Low, plus monitoring burden	Recurring, scales with volume	Near zero per transaction
Confirmation	Signed MDN receipt	Weak, needs reconciliation	Managed by the network	Multiple receipt types, built in
Where it dominates	North American retail (Walmart named)	Smaller partners, lower volume	Fragmented, mixed-capability partner bases	EU, pharma (PGLN), energy (ENTSO-E), finance

Most established suppliers end up running more than one of these at once, by accumulation rather than by original design.

Choosing among them

Most large retailers specify AS2 or a VAN in their onboarding requirements, so the starting point is rarely a free choice. Where flexibility exists, high-volume direct relationships favor AS2, lower-volume or infrastructure-constrained partners often work better on SFTP, a large, fragmented partner base still gets value from a VAN's managed routing, and a partner or sector mandate is what actually moves the decision toward AS4. Organizations that manage this mix well document it deliberately: which protocol applies to which partner, why, and what the fallback is if a connection fails.

BOTTOM LINE

None of these four protocols is obsolete, and none is universal. Protocol selection is an ongoing operational decision, not a setting configured once at onboarding.

4

WHAT CHANGES • CHAPTER 4 OF 7

What AS4 Actually Solves

Most of the conversation about AS4 covers what goes wrong if you don't migrate. This is about what goes right when you do.

01 Security travels with the message

AS2 encrypts the connection; AS4 encrypts the payload itself with WS-Security and XML signatures. The signed SOAP receipt proves the specific recipient got the specific content, intact.

02 Delivery stops needing a second check

Built-in duplicate detection, delivery receipts with real error codes, automatic retries. The transport layer earns trust on its own.

03 Compliance evidence builds itself

Signed receipts, sender and receiver verification, timestamps, payload hashes, delivery confirmation, generated with every transaction.

04 Onboarding drops from weeks to days

Processing Mode Agreements standardize the handshake, turning custom configuration and certificate exchange into a days-long task.

05 One message, multiple documents

AS2 sends one payload per transaction. AS4 bundles an invoice with backup documentation, or a purchase order with spec sheets, into a single message.

06 Partners behind a firewall become reachable

AS4's pull mode lets partners request messages on their own schedule, no public endpoint required.

07 The cloud roadmap stops fighting B2B

AS4's SOAP-based architecture integrates natively with API gateways and event-driven systems, no middleware bridge needed.

08 Failures resolve in logs, not phone calls

Every message gets a unique ID and signed receipts tied to structured metadata. Root-cause analysis becomes a search, not a scramble.

09 Errors speak a shared language

Standardized signals, authentication failure, decompression error, duplicate message, receipt timeout, mean both partners see the same error regardless of platform.

The cost line that actually moves

Migration carries an upfront cost, but legacy EDI carries hidden ongoing costs: manual troubleshooting, onboarding labor, audit preparation, middleware maintenance, and IT staff tied to workarounds instead of strategic work. Organizations that track those numbers consistently find AS4 pays for itself within two years.

BOTTOM LINE

These outcomes show up within months of migration, not years. Stronger security, reliable delivery, compliance evidence on autopilot, and faster partner connections are operational, not theoretical.

HOW TO GET THERE • CHAPTER 5 OF 7

5

Seven Pitfalls That Derail AS4 Upgrades

The decision to migrate is the easy part. Execution is where projects go off track.

With dozens of enterprise AS4 upgrades, the failures almost never come from the technology itself. They come from gaps in planning, testing, and coordination that seem minor at kickoff and compound fast once production traffic is flowing.

PITFALL 1 **Incorrect Certificate Handling**

Teams treat certificate setup as a one-time task and forget expiration cycles, chain-of-trust validation, or partner certificate rotation. The result is failed transactions that look like infrastructure problems but are really credential problems.

THE FIX

Build certificate lifecycle management into the migration plan from day one. Automate expiration alerts and document every partner's renewal process.

PITFALL 2 **Missing Agreement on Profiles**

Both sides assume alignment on AS4 profile configuration, compression, encryption algorithms, and receipt types without formalizing it. Go-live hits, and compression settings do not match.

THE FIX

Establish a written Processing Mode Agreement with every trading partner before testing begins. If it is not documented, it is not agreed.

PITFALL 3 **Insufficient Error-Handling Logic**

If the plan for a failed message is "it retries until it times out," the design covers only the happy path. AS4 surfaces specific failure scenarios, duplicate detection, receipt timeouts, decompression errors, that each need a mapped response.

THE FIX

Map every failure scenario AS4 surfaces to a specific alert and recovery workflow, designed before go-live, not after the first production incident.

PITFALL 4 **Incomplete Partner Testing**

Most teams test connectivity, send a few sample transactions, and call it done. What they skip is what actually breaks them: large payloads, multi-attachment messages, high-volume bursts, and failure-recovery scenarios.

THE FIX

Run a structured test plan with negative testing, load testing, and partner-specific scenarios. If a partner cannot participate in full testing, flag that as a named risk.

PITFALL 5 **Poor Logging and Message Tracking**

Old logging habits migrate even when the old protocol does not. Teams then cannot trace a failed message end-to-end or connect a transport error to the business document it affected.

THE FIX

Implement structured logging that ties transport events to business transaction IDs using AS4's metadata-rich receipts and MessageID tracking, for rapid root-cause analysis.

PITFALL 6 **Ignoring Configuration Parameters That Matter**

Defaults are not decisions. Many teams accept default settings for reliability, compression thresholds, and duplicate detection windows without testing performance under real traffic.

THE FIX

Treat security policy, reliable messaging, payload handling, and receipt semantics as explicit design decisions, not defaults to accept blindly.

PITFALL 7 **Rushing Cutover Without a Rollback Plan**

Under deadline pressure, teams flip the switch to production without a documented rollback path. If something goes wrong, recovery becomes improvisation.

THE FIX

Define rollback triggers, procedures, and communication plans before cutover. Run both protocols in parallel and decommission the legacy path only after a defined stability window.

BOTTOM LINE

Every one of these seven traces back to the same mistake: treating migration like a simple technology swap instead of an operational program with cross-team ownership.

HOW TO GET THERE • CHAPTER 6 OF 7

6

Partner Readiness and Coordinated Cutover

A protocol change is bilateral. No team can complete it alone.

An AS4 migration only succeeds at the pace the slowest committed trading partner can move.

Internal readiness, tested infrastructure, mapped error handling, a documented rollback plan, solves half of the problem. The other half lives with every partner on the other end of every connection being migrated, and that half is not inside any one team's direct control.

Assessing partner readiness honestly

- Confirm whether each partner already supports AS4 natively, is actively planning a migration, or has no near-term plan at all. Treat these as three different populations, not one undifferentiated list.
- For partners with no near-term AS4 plan, confirm whether AS2 will remain viable for that relationship indefinitely, or whether a mandate is coming on a timeline the partner has not yet communicated.
- Ask each partner directly what their own testing capacity looks like. A partner who cannot commit real testing time is a named risk to the schedule, not a detail to discover during cutover week.

Sequencing a coordinated switch

- 1** **Move the partners who are already AS4-ready first.** They validate the internal configuration with the least coordination risk, and lessons learned there transfer to every partner that follows.
- 2** **Group partners with similar profiles into the same wave.** A shared industry, a shared PMode configuration, or a shared testing timeline lets one partner's validated setup shorten the path for the next.
- 3** **Keep AS2 live for every partner until their specific AS4 connection clears testing.** A coordinated switch never means flipping every connection at once. Each partner moves only once their side confirms readiness, independent of where every other partner stands.

BOTTOM LINE

The migration plan belongs to the internal team. The migration timeline belongs to every partner on the other end of it.

7

HOW TO GET THERE • CHAPTER 7 OF 7

Certificate and Key Management

The failure mode that looks like an infrastructure problem and is actually a calendar problem.

An expired certificate does not announce itself.

It fails transmissions silently, on either side of a connection, until someone notices documents have stopped arriving. That failure mode carries over from AS2 into AS4 unless certificate lifecycle management gets built into the migration plan directly rather than treated as a one-time setup task.

What a working lifecycle process covers

Expiration tracking

Every certificate, on both sides of every connection, with an alert threshold set well ahead of the actual expiration date, not on it.

Documented renewals

A renewal process per trading partner, since certificate exchange procedures vary by partner and by platform.

Chain-of-trust validation

A standing check, not a one-time verification at initial setup.

A named owner

Certificate management gets its own owner, distinct from general AS4 platform ownership, so the task does not fall into the gap between roles.

Where AS4 raises the bar over AS2

AS4's stricter security requirements make certificate and key management a higher-stakes discipline than it was under AS2, not a lower one. Message-level signing and encryption mean a certificate problem affects the message itself, not just the transport connection carrying it. The operational fix does not change: track expiration proactively, document the renewal process per partner, and never let certificate maintenance default to whoever happens to notice the failure first.

BOTTOM LINE

Certificate expiration is the single most common cause of an AS4 connection that looks broken but is actually just overdue for maintenance.

**CLOSING**

A Protocol Decision, Made on Purpose

Know which category you are in before spending a migration budget.

AS4 is not a universal upgrade, and this guide has not tried to argue otherwise.

It is the right answer for an organization with a real driver in front of it: a partner mandate, a regulatory framework, or a compliance gap an audit surfaced. For everyone else, AS2 remains a defensible, dominant choice in North American retail, and the right move is knowing which category you are actually in before spending a migration budget.

Where to go next

**Start with Chapter 5**

Seven Pitfalls is the single highest-leverage chapter in this guide. Most AS4 failures are planning failures, not technology failures.

**Confirm partner readiness before setting a cutover date**

Chapter 6's sequencing only works if every partner's real testing capacity gets checked directly, not assumed.

**Put a name on certificate ownership**

Chapter 7's single biggest failure mode has a single fix: someone specific owns it.

A

APPENDIX

The AS4 Readiness Checklist

Answer honestly. This is a self-check, not a scored assessment.

Count how many statements are true for your environment right now.

The seven statements

- ☐ Our EDI transport protocols have not been reviewed or updated in the last three years.
- ☐ We rely on transport-level encryption without message-level digital signatures.
- ☐ Onboarding a new trading partner takes more than four weeks on average.
- ☐ At least one trading partner has already mentioned AS4, PEPPOL, or eDelivery requirements to us.
- ☐ Our team could not produce a complete audit trail for a transaction from last quarter without manual log-tracing.
- ☐ We do not have a documented certificate renewal process for our EDI connections.
- ☐ Our IT team spends more time maintaining existing EDI integrations than building new capability.

Reading the count

0 to 2
TRUE

Legacy EDI is likely still the right fit. Revisit this checklist annually or when a partner raises AS4 directly.

3 to 4
TRUE

Worth a deliberate evaluation. Start with Chapter 2 and Chapter 3 to size the gap before committing to a timeline.

5 to 7
TRUE

The exposure is real and likely already visible to risk, compliance, or a partner. Chapter 5's seven pitfalls are the right next read before scoping a migration.



ABOUT DIVIHN

About DivIHN

Technology, Cybersecurity & Workforce Solutions

DivIHN Integration Inc. delivers technology, cybersecurity and workforce solutions to federal, state, local, education and commercial clients.

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Ready to plan your AS4 upgrade?

Talk to DivIHN about an AS4 readiness assessment built on the guidance in this guide, from partner readiness through certificate ownership and cutover.

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