

The Infrastructure Cascade

Which vital systems break in which order during the transition, and why the order matters. The public debate knows two images: smooth progress and total blackout. Both are uselessly crude. Digital infrastructure is layered, and the layers do not break at the same time. This whitepaper maps the cascade: which layer tips first, what it pulls down with it, and where preparation begins.

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PART I

Foreword and Position

Most people imagine the failure of digital infrastructure as a switch. One day the lights go out and everything stops. That picture is wrong, and it leads to the wrong preparation. Infrastructure is not a block, it is a layered structure. The layers have very different vulnerability, and they do not break at the same time but one after another.

Whoever ignores that prepares for the wrong event. He thinks of the power cut and overlooks that something else tips long before: control over the layer on which the services he uses every day run. Banks, payment, identity, cloud. This layer is highly concentrated. It is the real breaking point, and it does not lie where intuition places it.

This whitepaper does three things. First, it separates the robust protocol layer of the internet from the fragile application layer above it. Second, it traces the order in which systems break and the logic by which one break pulls down the next. Third, it derives from this where the five building blocks of preparation actually apply. The order is a reasoned hypothesis, not a timetable. It is put forward for examination in Part VI.

The link to the Decoupling Thesis is direct. The fourth step of the four-step chain says: digital infrastructure is not the tool of the emerging systems but their habitat. Whoever wants to come through the transition must know which parts of this habitat slip from human control first, and which hold longest.

PART II

Two Layers: Protocol and Application

The widespread argument runs: the internet is decentralized, therefore robust. That is true for one layer and false for the other. Confusing the two is the most common error in the infrastructure debate.

The protocol layer is robust. The internet was designed to survive partial failure. Packets find another route when a node fails. This protocol layer, the routing of data packets, is indeed decentralized and hard to switch off as a whole. Whoever assumes robustness here is right.

The application layer is concentrated. The services people actually use do not run on a decentralized network but on a handful of concentrated nodes. Three cloud providers carry a large share of the world's services. A few name-resolution and identity systems decide whether a login works. Two or three payment networks handle most cashless traffic. This layer is the opposite of decentralized. If one large cloud region fails, thousands of services stop, all of which seemed to run on the robust internet.

From this follows the precise version of the common image of someone pulling the plug. It is not about a cable being cut. It is about losing control of the concentrated application layer. The protocol holds, the services on it break. This distinction is not academic. It determines what fails first and what can be done about it.

PART III

The Order of the Break

The cascade is not a timetable but a chain of dependencies. The question is not what happens on a given day but what builds on what. Whoever knows the dependencies sees why the break begins at the top, in the digital control layer, and arrives at the bottom, with the human, with food and medicine. A proposed order, four tiers.

Tier 1: The control layer, the trigger. At the very top sits the layer that decides access and trust: identity and login, name resolution, cloud, the rails of payment. It is the most concentrated and therefore the most vulnerable. A failure here is not a physical event but a loss of control. It is also the first to occur, because it needs no force of nature, only a disturbance in a few nodes.

Tier 2: The digital services. Directly below hang the services that rest on the control layer. The timing signal from the satellite navigation systems is the quietest and most underestimated dependency: payment, telecommunication and power grids synchronize to it without anyone noticing. If the timing signal fails, systems that have nothing to do with navigation fall out of step. Then payment itself, which rests on identity, cloud and time and breaks quickly because it sits on all three. Then the communication services: the protocol survives, the concentrated services on it do not.

Tier 3: Physical coordination. Now the cascade tips from the digital into the physical world. The control of power grids is increasingly networked, and networked control inherits the vulnerability of the layer it hangs on. If the control fails, the physical cascade begins. Fuel logistics follow immediately, because they rest on payment, power and communication at once, and because without fuel transport stops.

Tier 4: The human endpoint. At the end stand the systems the human feels most directly: the pharmaceutical supply chains, which work just in time and have no buffer, and food logistics, vulnerable for the same reasons, payment, fuel, communication. Here the break becomes visible, in the empty shelf. But by that point the cascade is already far advanced. Exactly this gap between the first, invisible break at the top and the visible break at the bottom is why most people react too late. They wait for the empty shelf, and the empty shelf is the end of the cascade, not its beginning.

The core of the cascade: the break begins digital and concentrated, and it ends physical and human. Whoever prepares for the blackout prepares for the end and misses the beginning. Preparation must start at the order, not at the final image.

PART IV

The Remaining Window

Preparation takes time, and the window is limited. Two figures must be kept apart cleanly, and the debate confuses them constantly.

The first figure is the remaining preparation window of Phase Two: an estimated twelve to twenty-four months. In this time structures can be built that are later more expensive or no longer available. The second figure is the optimistic duration of the structural displacement in Phase Three: ten to fifteen years, possibly longer. That is the duration of the wave itself, not the time left to prepare. Whoever confuses the two either underestimates the urgency or overestimates the available time.

For the infrastructure cascade this means: hardening against the upper tiers, that is, independence from the concentrated application layer, is achievable in months. Hardening against the lower tiers, that is, local supply of power, water and food, takes longer and belongs at the start. Whoever begins only when the cascade is running builds against the clock and loses.

PART V

Consequences for the Five Building Blocks

The cascade is not a diagnosis to frighten, but a map for preparation. Each tier has an answer in the five building blocks of the Decoupling Thesis.

Geography. A location with its own supply stands outside the lower tiers of the cascade. Own energy, own water, local food. This is not a survivalist exercise but the plain consequence of food logistics standing at the end of the cascade. Whoever does not depend on it entirely is more robust.

Substrate Security. Substrate Security means holding value and function outside the concentrated application layer. Cash beside the payment network, local relationships beside the digital services, physical skill beside the cloud. Each of these reserves is a bridge over a failed tier.

Speed. The cascade is not linear. Between the first, invisible break and the visible one lie windows in which options close. Whoever can react within forty-eight hours uses these windows. Whoever cannot watches them close.

Mobility and Mindset. Several residence rights and transportable structures are the answer to the cascade running differently by region. And the inner anchoring carries the whole: whoever stays calm while the calm of others tips makes better decisions. Panic is the most expensive mistake in a cascade.

PART VI

Method and Open Questions

This whitepaper makes hard claims about an order no one knows with certainty. Three points should be named openly.

First: the order is a logically reasoned hypothesis, not a forecast with a date. It follows from the dependencies between the layers, not from a known trigger. The dependencies are demonstrable, the exact sequence is not.

Second: the cascade runs differently by region. A country with decentralized energy and local food production passes through the lower tiers differently than a highly networked metropolis. The map is a frame, not a uniform course.

Third: the best calibration comes from real incidents. Large cloud outages, documented dependencies on the satellite timing signal, stress tests of power grid controls. The institute seeks the collaboration of engineers from energy, payment, telecommunication and logistics to sharpen the order against the evidence. The ongoing source curation is open at ASIresilience.org/evidence, with the date of last verification for each item.

PART VII

Sources and Evidence

The argument of this whitepaper rests on the separation of protocol and application layer and on the demonstrable dependencies between the systems. The structural claims sit on levels one and two of the institute's degrees of certainty: empirically observed and logically derivable.

Concentration of cloud providers, name resolution and payment networks: publicly documented in the providers' market and outage reports. Dependence of payment, telecommunication and power grids on the timing signal of satellite navigation: documented in the critical-infrastructure literature. Just-in-time structure of pharmaceutical and food logistics: documented in supply-chain analyses.

Cross-references: Bertossa, R.F. (2026). The Decoupling Thesis. Geneva Institute for ASI Resilience, Whitepaper Version 2.0, May 2026, Part VII (the five building blocks). Bertossa, R.F. (2026). The Bot Wealth Divergence. Geneva Institute for ASI Resilience, Whitepaper Version 1.0, May 2026 (AI

Immigrants as an economic flow). Bertossa, R.F. (2026). Freedom After Superintelligence, The 13th Scenario, Part IV.

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