ONVIF Engineer's Quick Reference

What ONVIF standardizes, how a camera is discovered, the seven profiles, and the pre-purchase checks that keep a multi-vendor system honest.

Profile	What it standardizes	Side	Note
S	Basic video streaming, PTZ, audio in	Video	Original (2012). Deprecating: last conformance submissions 2027-03-31.
T	Advanced streaming: H.264/H.265, imaging, motion & tamper events, metadata, two-way audio	Video	The 2026 baseline for IP video. Successor to S.
G	Recording configuration, search, replay	Video	Manage / pull back video stored on the camera (edge).
M	Metadata & events for analytics (objects, faces, plates, geolocation; via stream, events, MQTT)	Video	The interface for results, not the analytics accuracy.
A / C / D	Access control: configuration (A), door control & events (C), peripherals (D)	Access	Use only when access control is in scope.

How a VMS finds a camera (WS-Discovery)

Multicast over UDP 3702 to 239.255.255.250. Camera sends Hello; VMS sends Probe; camera replies ProbeMatch with its service address (XAddrs). Multicast is link-local -- across a subnet or VLAN, add cameras by IP / IP-range, not discovery. Authenticate with WS-UsernameToken (hashed password digest, never plain text); discovery is not access.

The standards boundary -- conformant is not fully featured

ONVIF guarantees a baseline: discovery, stream setup, PTZ, events, the metadata interface. The actual video leaves over RTSP/RTP, not over SOAP. Vendor-specific features -- proprietary analytics, advanced motion zones, camera AI parameters -- usually need the manufacturer SDK (Axis VAPIX, Hikvision ISAPI, Dahua SDK), because the standard treats them as conditional / proprietary.

Before you buy: five conformance checks

Check	Why it matters
Is it on the ONVIF registry?	'Supports ONVIF' on a box can be a partial implementation. Verify the model on onvif.org/conformant-products.
Which profile(s), device AND client?	Conformance is two-sided. A Profile T camera with a Profile S client gets you only S. Match both ends.
Does my key feature travel over ONVIF?	If the project depends on a specific analytic or setting, confirm it is in-profile -- or plan the vendor SDK path.
Did you stage a real connection test?	Test discovery, auth, stream, and events against your actual VMS before committing to volume.
Are default credentials changed?	ONVIF leaves security to you. Factory-default passwords are a documented hole, not a convenience.

Ports: WS-Discovery UDP 3702. RTSP TCP 554. Sources: ONVIF Profiles & Core Specification; OASIS WS-Discovery 1.1; IETF RFC 2326 (RTSP). ONVIF: 7 active profiles, 33,000+ conformant products (2026).