NAT Gateway vs NAT instance

NAT Gateways and NAT instances both serve the same purpose of providing Network Address Translation capabilities within an AWS ecosystem. However, they possess characteristics that make them quite different from each other. These characteristics and how they make both offerings suitable for slightly different use cases is explored below:

A NAT Instance is an EC2 instance configured to perform NAT functionality. The burden of installing and managing said NAT software, its scaling, and perform maintenance on it however falls entirely upon the cloud administrator.

A NAT Gateway on the other hand, is a fully managed service provided by AWS, the cloud administrator therefore does not need to manage the underlying infrastructure with AWS handling the scaling and maintenance of the NAT infrastructure.

NAT Gateways are a newer offering compared to NAT instances, and treated by AWS as successor to NAT instances, a much older services. NAT gateways are, as such, kind of configured for modern environments out-of-the-box, something not true for NAT instances which make them a sort-of legacy offering by default.

Therefore, it is worth noting that when dealing with NAT, AWS encourages the use of NAT Gateways in almost all possible cases, especially for newer projects. In fact, AWS suggests that if feasible, cloud administrators managing legacy projects replace all older NAT instances with NAT gateways and might be planning on making NAT instances defunct soon (though it has not done it so far, at least at the time of writing).

A more detailed comparison of the two is provided below:

Feature	NAT Instance	NAT Gateway
Management	User-managed (you control the EC2 instance)	AWS-managed (fully managed service)
Cost	Generally cheaper (pay for EC2 instance)	More expensive (pay per hour + data processed)
Scalability	Manual (need to manage scaling)	Automatic (scales based on usage)
Availability	You need to set up redundancy and failover	Highly available by default
Performance	Limited by instance type and size	Generally better, with higher bandwidth
Maintenance	User responsible for updates and patches	No maintenance required
Use Cases	Custom configurations or special requirements	Standard use cases with no special requirements

In summary, if you're looking for ease of management, scalability, and reliability, a NAT Gateway is the way to go. If you have specific customization needs or are operating on a tight budget, a NAT Instance might be more suitable.